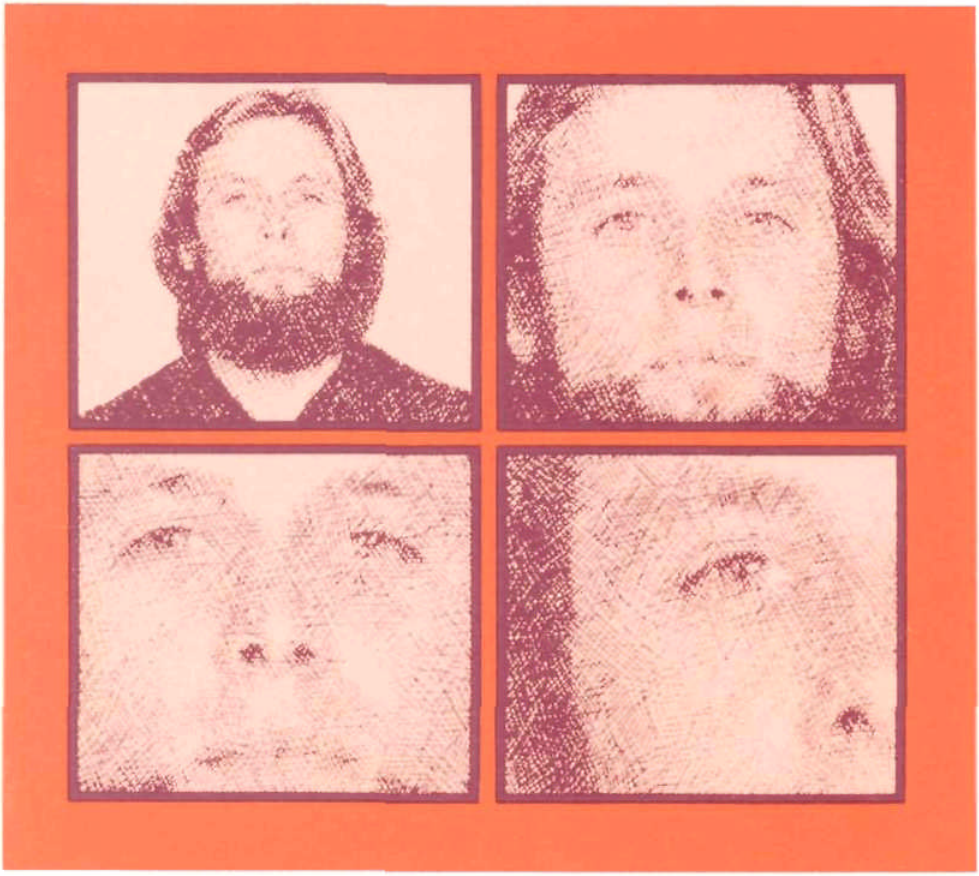
the Skeptical Inquirer

THE ZETETIC

The Power of Psychic Belief



New Perpetual Motionists
Astrology Fails Test
Science, the Bible, and the Big Bang
Critical Thinking in the Classroom

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News and Comment

Articles on the paranormal: Where are the editors?

A recent article in *Time* magazine asked where the editors are who are supposed to be guarding the principles of good language? The article dealt with the proliferation of bad English usage by well-known writers and why book editors often don't edit.

But the same kinds of questions can be asked about the *content* of many of the articles that get published about the paranormal. The question that keeps coming to mind is, Where are the editors?

If the writers aren't asking the tough, skeptical questions that might really cast light on the psychic claims being enthusiastically described in these articles, why aren't the editors? The job of an editor isn't just to see that the commas are in the right places. He or she is supposed to see that the subject is dealt with honestly and to ensure that the judgments and perspectives offered by the writer have some broad measure of support. That is admittedly a tough task. It requires thinking about what is *not* included in the draft of the article as well as what *is*. It requires active questioning. And it requires really caring about the truth.

Judging by many of the recently published magazine articles about the paranormal, their editors are uninformed about scientific attitudes toward the paranormal (i.e., basically skeptical) or uninformed about the shortage of reliable scientific evidence for such claims. Or they've suspended all their own critical faculties. Or all of the above. Sometimes they appear to be active participants in the process of distortion, although I'm sure they don't consider themselves as such.

The problem is not one of factual inaccuracy. Usually the *facts* are correct. The problem is with the selection process that determines which facts are included and which facts are omitted. Often the facts omitted are those that might weaken a seemingly good story. Hard, skeptical questions are not asked. The overall result is to drastically warp the article's perspective to give a dramatic, but not altogether accurate, view of the subject.

Let's take some examples. An article in the September-October 1980 *Science Digest* (Special Edition) is titled "Physicists Explain ESP." Its basic contention is that the number of scientists accepting the claims of ESP is growing and that physicists are in the vanguard of the new believers.

It begins by stating that, according to a recent poll, a majority of American scientists accept the possibility that

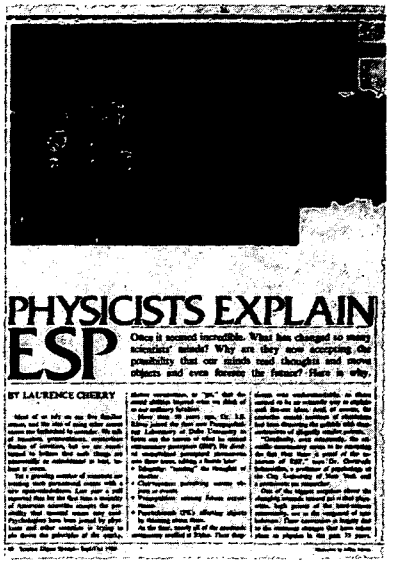
unusual senses may exist. So what? Scientists work at the frontiers of knowledge. Virtually every scientist I know will accept the likelihood that virtually *anything* is *possible.* What they really care about is whether it has been demonstrated to be highly probable. What was the percentage of scientists in that survey who felt that ESP was "an established fact"? I'll tell you: 9.5 percent. Hardly a landslide. That fact might have cast a considerably different light on the subject. It was not mentioned.

Another interesting sidelight about that survey: It showed that the leading source of scholars' beliefs about ESP was not reports in scientific journals but what they read in the newspapers.

The article quotes an academic parapsychologist: "Gradually, even reluctantly, the scientific community seems to be accepting the fact that there is proof of the existence of ESP." We've just seen that nine out of ten scientists don't. The parapsychologist quoted is known among critics as an especially credulous, pro-psi person. That is a frequent deficiency in articles on the paranormal: quoting only strong believers.

The article goes on to mention a handful of physicists who are doing research on extrasensory perception, notably Russell Targ, Harold Puthoff, Robert Jahn, John Hasted, and Brian Josephson. It makes no mention of the studies casting into serious question the research methods and conclusions of Targ and Puthoff. Did the editor not know of these studies?

But the article's central deficiency is the lack of historical perspective. It could have mentioned that physicists have a very bad track record with this subject. In every generation a few physicists take up psychic research. Some are only demonstrating normal scientific curiosity. Others make gran-



PHYSICISTS EXPLAIN ESP

Once it seemed incredible. What has changed so many scientists' minds? Why are they now accepting the possibility that our minds read thoughts and move objects and even foresee the future? Here is why.

BY LAURENCE CHERRY

diose claims. What has become of this research and those claims? Nothing. And this has been going on since all the way back in the 1800s when Sir William Crooke made his claims of a psychic force.

The article could have mentioned, but didn't, the physicists who in just the past six years have made strong and widely publicized claims about the reality of ESP only to totally reverse themselves shortly thereafter upon looking into the matter a little deeper.

It could have mentioned that magicians (or magicians posing as "psychics") find scientists in general and physicists in particular easy to fool because they tend to be straight-line thinkers unaware of the psychology of deception.

It could have mentioned the eminent physicist John A. Wheeler's disgusted attack on those naive proponents of ESP who mistakenly interpreted his research as a possible explanation of their claims.

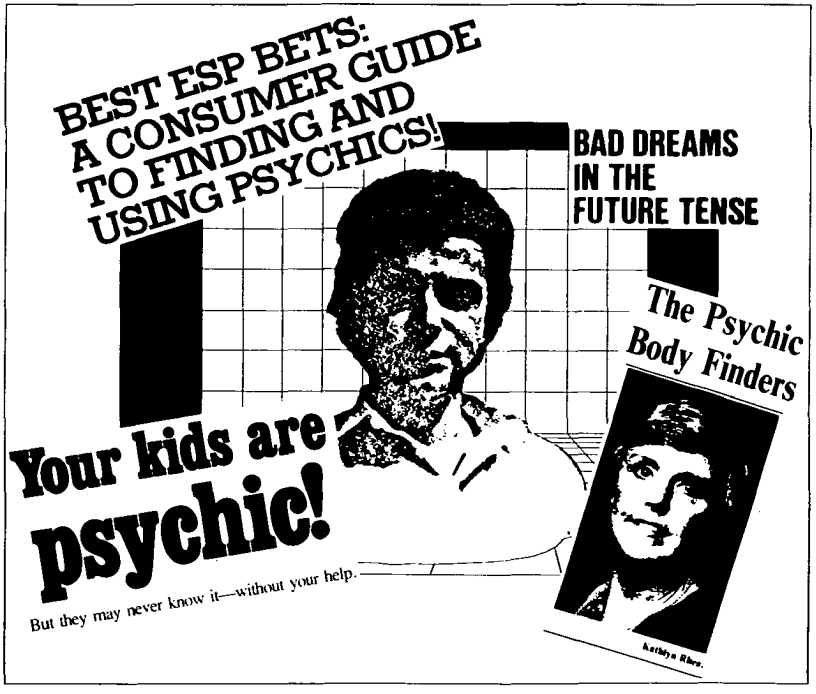
Most important, it could have mentioned that, despite 100 years of enthusiastic claims that scientific proof

of ESP was just around the corner, that proof is just as elusive now as it was way back then.

In short, the *Science Digest* article is most notable for what it omits. Why weren't the editors demanding that these points be inserted? Didn't they at least suspect that there might be slightly more to the story?

An article in *California Living* magazine, in the San Francisco Sunday *Examiner and Chronicle*, on March 9, 1980, dealt with "The Psychic Body Finders." Here is a subject that cries out for good investigative reporting. This one, however, like other recent articles on the subject, is mostly a collection of anecdotes about supposed successes of "psychics" in helping the police. Ironically, the article points out that in one case psychic claimant Kathlyn Rhea's complete miss was amazingly interpreted by the press and public as a dramatic "hit" because her directions turned up two animal bones and a shirt—not belonging to the missing man. But instead of learning anything from this example, the writer treats this miss and the public's credulous reaction to it as a rare aberration. The hard questions weren't asked: How often do these "psychic body-finders" fail? How many guesses do they make before they get one right? And how specific are they? Why do we hear only of the "successes"? And the article makes no mention of the only controlled study I know of that examines the claims of so-called psychic crime-fighters, the one in which the Los Angeles Police Department found them to be of no use at all in criminal investigations (*SI*, Summer 1979).

Not to be outdone, the next week's *California Living* in the *Los Angeles Herald Examiner* carried an article entitled: "Best ESP Bets: A Consumer Guide to Finding and Using Psychics."

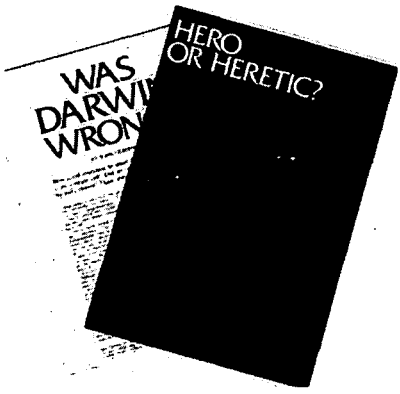

BEST ESP BETS: A CONSUMER GUIDE TO FINDING AND USING PSYCHICS!
BAD DREAMS IN THE FUTURE TENSE
The Psychic Body Finders
Your kids are psychic!
But they may never know it—without your help.

An analysis of this gem could take up a whole article in itself. It is enough to point out that it doesn't ask the most basic question of all: Is there any such thing as a "psychic"—a person with clearly demonstrable abilities in ESP? I know of no scientific proof of such. Even most parapsychologists warn against accepting the word of persons who say they have strong psychic abilities.

The March 1980 issue of *Instructor*, a magazine for teachers, carries an article boldly titled "Your Kids Are Psychic!" Here again psychic abilities are unquestionably presumed. I can understand this on the part of the authors, who have written a book making the same claim, but why didn't the editors of the journal ask whether this was a responsible treatment of the subject? Did they even care? Why didn't they seek out some other views? Did it ever occur to them to ask, "Isn't this a little ridiculous?"

In "Bad Dreams in the Future Tense," in the March 1980 *Playboy*, the author devotes nearly eight pages of text to claimed precognitions and the Central Premonition Registry in New York City. The article is filled with anecdotes of dreams that came true. It does manage to acknowledge that with more than 200 million Americans sleeping every night sooner or later someone's dream is going to come true. But that deters neither author nor editor. They go right on making mountains out of a few dreamed molehills. Never do they ask whether the fact that only 47 of the thousands of predictions in the registry have ever qualified as "hits" might mean that coincidence is the only operative force. That would ruin the story.

Another way magazine editors mislead the public on fringe-science subjects is revealed in two more articles in the September-October *Science*



Digest. If you read the article about Immanuel Velikovsky—"Hero or Heretic?"—all the way through, you find that author Robert Jastrow concludes at the end that Velikovsky was wrong. Yet all the display type and indeed the entire first three-fourths of the article imply otherwise.

"Scientists were outraged when Immanuel Velikovsky's *Worlds in Collision* was published," the teaser type under the article's title proclaims. "Yet those who attacked him did not consider the facts. The eminent scientist who wrote this article did."

If that isn't distortion, I don't know what is. No scientists who ever criticized Velikovsky's theories ever considered the evidence? Jastrow is the only one who has? What nonsense! Carl Sagan, David Morrison, and George Abell, to name just three, might have cause to disagree.

Even worse, in a way, is the title screaming off the page on another article in the same issue: "WAS DARWIN WRONG?" The first paragraph begins with a reference to creationists' attacks on evolution. Anyone who reads the article will find that it's a fine report on recent developments in evolutionary science, unrelated to creationist claims. But the casual reader only flipping through the pages will be led to believe that there are some serious scientific

questions being raised about whether evolution occurs. A science periodical needn't deal in such sensationalism.

In the latter two cases, the editors were obviously intentionally striving for the effect achieved. But the more common deficiency in editors' handling of magazine articles on the paranormal is to rely too much on the point of view of the free-lance writer submitting the article. Too often no one does any independent checks of the evidence. Usually no one even questions the most fundamental premises. The editor too often disengages his brain and disconnects the circuits to his skepticism. Popular periodicals need more editors who exhibit the innate tough-mindedness and skepticism of an old-time newspaper city editor. Where are such editors today?

—*Kendrick Frazier*

A Soviet flap over psychic healing

A flap over the sensational claims of a self-proclaimed psychic healer in the Soviet Union this year shows once again that public fascination with, and gullibility over, supposed psychic phenomena has no national boundaries. This time, though, there was a quick response from Soviet scientists, who warned the public against acceptance of the myth of "bio-fields."

The "healer" is a woman named Yevgeniya Davitashvili, whom everyone calls Dzhuna. She has gained a cult following in the Soviet Union because of her claimed ability to cure diseases with the force of a biological field emanating from her hands. Her reputation has spread with the aid of rumors that she has helped prominent officials regain their health, including Leonid Brezhnev himself.

A reporter for the Communist youth newspaper *Komsomolskaya Pravda* further hyped her powers in August with a glowing account of his supposedly witnessing her feats, which included reviving a bouquet of dried roses by passing her hands over it. He called for the creation of a scientific center for the study of psychic phenomena. His report gained wide publicity, including an article from Moscow in the August 18 *New York Times.*

The response was quick. A group of Soviet medical scientists reported in the intellectual weekly *Literaturnaya Gazetta* that there was no evidence to back Dzhuna's claims or those of other faith healers. The panel described an experiment that had been set up to test her supposed powers. Seven persons with skin ulcers were checked before, during, and after their sessions with Dzhuna. "All of us have come to the conclusion that there were no objective indications of improved state of health of ill persons." Scar tissue that had formed was the result of routine hospital care, including a supervised diet and sanitary conditions, the report said, according to a United Press International dispatch printed in U.S. newspapers on August 28. The August 28 *New York Times* also carried a follow-up article reporting the scientists' critique.

The panel also criticized a leading Marxist philosopher, Aleksandr Spirkin, who had been promoting paranormal phenomena in lectures throughout the Soviet Union.

The panel, commissioned by the Georgian Ministry of Health, said that the power of suggestion and psychosomatic effects help people to feel better and that a sense of well-being does contribute to recovery from ailments. But, said the panel, "there are no trustworthy reasons to believe that some bio-field, different from the

known physical fields, can be used . . . as a long-awaited medicine for all . . . Myths are good in literature and art, but they can be dangerous in practical activity, and dangerous in the highest degree when attached to medicine."

—*K.F.*

Tempest in a saucer: Smithsonian's UFO symposium

"How many of you have had a UFO experience?" the panelists in Baird Auditorium asked their symposium audience of 300.

About 75 raised their hands.

How many thought what they saw might have a simple, earthly explanation? Only a dozen hands went up.

These were the hard core—the believers and the uncertain skeptics—who cared enough to spend $25 and a sunny day off seriously exploring a subject usually treated in screaming headlines at the checkout counter.

It was a day devoted to the unidentified and the inexplicable—an all-day UFO symposium, September 6, 1980, sponsored by the Smithsonian Resident Associates. Under the firm hand of moderator Frederick Durant, former special assistant to the Air & Space Museum director and once involved in a major government UFO study, three ranking UFO investigators met three confirmed skeptics in a sometimes searing verbal encounter.

"I love a good mystery," said gray-bearded J. Allen Hynek, the scientific director of the Center for UFO Studies, emeritus professor of astronomy at Northwestern and former Air Force UFO consultant, who led off the day's presentations. "Reading a good UFO report is like reading Agatha Christie—except there is no last page to turn to."

Hynek, in cream-colored jacket and sky-blue tie dotted with planets, his head bowed over the lectern, hastily recounted the facts of "the UFO phenomenon" that led him to more than three decades of investigation: the existence of thousands of UFO reports, the persistence of those reports, their global distribution and the strikingly high calibre of many witnesses.

"There *is* something unusual going on here," insisted Navy physicist Bruce Maccabbee, the earnest chairman of the Fund for UFO Research, who pressed the significance of sightings by highly qualified observers such as military pilots, astronomers and the Gemini 11 astronauts.

"UFO Handbook" author Allan Hendry, whose more than 2,000 investigations for the Center for UFO Studies have included "CE-III's" (close encounters of the third kind, a term that predates the movie) with "UFO-nauts," outlined in his radio-announcer voice what he considered one of his most reliable reports—a 30-second daylight encounter with a speeding silver hat-shaped object by two families on an Illinois freeway.

But the skeptics kept their opponents on the defensive through most of the day. Countered Philip Klass, gray-suited senior editor at *Aviation Week and Space Technology* magazine and author of *UFOs Explained*: "UFO promoters have not been able to come up with anything but unexplained cases. There is no scientifically credible evidence." It's time for UFO proponents to "put up or shut up," he said.

"UFOs seem to behave like fairies and ghosts," sniped author-investigator Robert Sheaffer of the Committee for the Scientific Investigation of Claims of the Paranormal, who termed UFOlogy a "failed science." "They always escape just before you can get any evidence."

"A triumph of hope over experience," suggested James Oberg, a 6-foot-8 NASA engineer and UFO

columnist for *Omni* magazine. With a NASA film, he demonstrated how a reflection in the Apollo 11 window became "ALIENS ON MOON WHEN WE LANDED" in a *National Enquirer* headline.

And so it went through the five-hour session. At one point Hendry dramatically tossed a paper off the lectern to make his point about the worth of conflicting lie-detector tests. During the most biting attacks on his work, Hynek slumped quietly in his chair, a hand on his chin.

Douglas Climenson, a mail clerk at NOAA who brought along his knapsack stuffed with newspaper clippings and UFO books, echoed the sentiment of some in the audience. Though he's never seen a UFO himself, he said, "I definitely believe they exist. The question is what they are."

When the skeptics and scholars finally crowded behind a table for the concluding panel discussion, a firefight was raging between Hendry and Klass over their methods of investigating a particularly controversial UFO abduction case in Mississippi. "I'm prepared to take a polygraph test on everything," Klass said expansively before Durant ended the argument.

When pinned down by a written question from the audience, no panelist was willing to say he believed a human had ever been abducted by an alien craft.

Nor did any panelist have any evidence that the U.S. government was holding anything back, such as the remains of alien creatures or their craft, as has been suggested recently by some UFO buffs. Hynek, however, citing possible informants who feared violating government secrecy laws, called for the president to offer immunity to anyone in the government or the military who came forward.

At symposium's end the question of alien creatures, like other topics of the day, remained unresolved. But as the panelists packed up and the audience filed out, moderator Durant, who retired from the Smithsonian just last week, said, "We don't have any in *our* collection."

—Stuart Rohrer

Stuart Rohrer is a reporter for the Washington Post, *where this article first appeared (September 8, 1980). Reprinted with permission.*

UFOs and Vallee

It was amusing to observe how, in an interview in the January 1980 *Omni*, UFO proponent Jacques Vallee tried to maneuver himself (with considerable help from *Omni*'s editorial introduction) into a highly sensible middle-of-the-road position on the UFO question. "Until now there have been only two positions," said he, that of the skeptics and that of the pro-UFO groups. "I've now reached the point where I can't believe one or the other," said Vallee.

This might sound convincing, unless one is familiar with Vallee's writings intended specifically for the UFO buffs. In *Passport to Magonia*, he rates fairy sightings as being every bit as credible as present-day UFO sightings, which he accepts. In *The Invisible College*, Vallee says that UFO entities utilize a "meta-logic" (which the unsophisticated dismiss as merely "absurd"), he expresses profound belief in the flim-flam tricks of spoon-bender Uri Geller, and he proclaims UFOs to be "truer than truth." In *The Edge of Reality*, Vallee analyzes the profound significance of elves (being careful to distinguish between "Elementals" and "Leprechauns"), the Red and Black Meu, and the sinister Men in Black. If these represent the beliefs of a reason-

able and moderate man of science opening up new vistas in reality, then I am at a loss to imagine what we might expect from a UFO believer in left field.

Vallee correctly observes that many of the observations of UFO witnesses totally contradict reality, defying all notions of time and space and all physical laws. But he surprisingly concludes that we are to *accept* the unsupported claims about UFOs and *discard* reality. He seems blissfully unaware of the growing literature of experimental data, most notably from psychologist Elizabeth Loftus and UFO researchers Alvin Lawson and Allan Hendry, indicating the gross unreliability of unsupported human eyewitness testimony. While Vallee may consider himself 1,000 years ahead of his time in his conception of the universe, in reality he is merely 25 years behind his time in his understanding of the psychology of human perception.

—Robert Sheaffer

Robert Sheaffer is a member of the CSICOP's UFO Subcommittee.

Howlers of the gods

How the mighty have fallen. Recently, a new book by Erich von Däniken, called *Signs of the Gods,* was published in the U.K. Once upon a time, publication of a new von Däniken book extolling the virtues of the gods from outer space was the signal for media excitement, but not any more. This time, von Däniken failed to make it onto British TV. His planned appearance on a BBC-TV current affairs program, on which I was to debate him, was canceled in favor of real news. It seems that as far as the BBC is concerned von Däniken is now dead and buried following the deftly incisive job done on him by the Horizon documentary team a while ago.

Signs of the Gods contains nothing to make scientists take his claims any more seriously than before. In the new book, von Däniken is caught contradicting his previous writings. Now he theorizes that extraterrestrials separated mankind from the apes a few tens of thousands of years ago by genetic manipulation. Previously he had claimed that the artificial mutation had been performed not on apes but on protomen such as *Homo erectus* who figure in the standard anthropological family tree of men. Alas, he does not explain why his theory has now changed, why the obvious ancestors of mankind are no longer good enough, or where this leaves the indubitable fossil record of mankind's evolution.

In his new book, he argues that the similarity in the blood protein of men and apes means that they can have been evolving separately for only a few tens of thousands of years, as against at least 10 million years as given by the fossil record. True, the date of the split between men and apes deduced from the rate of chemical change in blood protein does conflict with the date from the fossil record. But evolutionists who use the same blood protein argument place the man-ape split at four million years ago; so von Däniken is still way short of the mark.

Here's another eyebrow-raising contradiction. Von Däniken takes a swipe at his critics by noting: "I never said that extraterrestrials built megalithic temples or pyramids," which might come as a surprise to his many readers who thought he was implying exactly that. But in the self-same book he does make such a claim. He says that giants (evidently the direct descendants of extraterrestrial visitors) erected the megaliths of Malta and Brittany before the end of the last Ice Age, 10,000 years or more ago. This is about twice the age

given by radiocarbon dating of organic matter found under the stones. Giants are needed, he says, because the weight and number of stones was too much for humans. We are left to presume that this logic also applies to Stonehenge, which contains larger and heavier stones than those in Brittany or Malta. The juiciest morsel is his suggested reason for the construction of the megaliths: to serve as a kind of prehistoric radio telescope!

One of his reasons for proposing the Ice Age date is that the standing stones of Brittany vanish into the Gulf of Morbihan, which would imply they were installed when the sea level was lower than it is today, as it was during the Ice Age. I checked with Professor Colin Renfrew of the University of Southampton, an outstanding archaeologist, who told me that the Gulf of Morbihan was flooded about 2,500 years ago, after the time that everybody agrees the stones were erected. Von Däniken is here using phony evidence to back up faulty logic.

Where is his evidence for the "giants" who allegedly built the megalithic monuments? You will need to look in a previous book, *According to the Evidence* (U.S. title: *Von Däniken's Proof*). In that, he shows photographs of so-called "giants' footprints" from the valley of the Paluxy River in Texas. These are fakes, apparently chiseled out by Texans during the depression to amaze tourists (*SI*, Fall 1979, p. 9). Von Däniken also refers to fossil bones of an extinct creature called Gigantopithecus. But Gigantopithecus is not a very convincing candidate for an Ice Age god. According to anthropologists, it was an ape rather like a large gorilla that lived at least one or two million years ago.

If the revered "giants" built megalithic tombs, as von Däniken claims, one would expect them to be buried there. But unless archaeologists are covering something up, there are no bones of giants, only of normal humans, in megalithic tombs.

On the one hand, to construct his view of mankind's origins von Däniken overlooks a fossil record that does exist, but in searching for evidence of giants, on the other hand, he makes appeal to a fossil record that doesn't exist. Once again, he has been caught attempting to blind the public with nonscience.

—*Ian Ridpath*

Ian Ridpath is a member of the U.K. branch of CSICOP.

Psi science Ph.D.: The rocky road

Last March, news organizations received a press release from John F. Kennedy University in Orinda, California, announcing that one of its faculty members, Jeffrey Mishlove, would in June receive a Ph.D. degree in parapsychology from the University of California at Berkeley—the first ever from an American university. Unconfirmed reports soon surfaced that the degree-granting decision had been accompanied by fierce divisions among Mishlove's academic review committee.

The behind-the-scenes story of that series of disputes is told in an investigative article by senior editor Berkeley Rice in the October 1980 *Psychology Today*.

Rice reports that the review committee had early reservations about the lack of critical scientific judgment Mishlove exhibited in his 1975 book, *The Roots of Consciousness*, a survey of parapsychological claims Mishlove submitted in support of his doctoral candidacy. The committee initially limited him to a "historical treatment of parapsychology" rather than experi-

mental research, which it considered him unqualified to do. Later that decision was altered, but a summary of his experimental research, which Mishlove submitted in the fall of 1977, upset the statistician on the committee, Robert Pisani. He called Mishlove's statistical analysis "hopelessly amateurish" and said his research failed to "even remotely meet the minimum requirements for scientific and statistical competence." After Mishlove submitted a draft of his dissertation in 1978, another committee member, experimental psychologist Robert Morris, said Mishlove continued to exaggerate "the significance of unscientific, anecdotal, and unsubstantiated claims of psychic powers."

According to Rice's report, the committee voted 4 to 2 to grant Mishlove a "terminal master's degree" rather than a doctorate. Mishlove protested and persuaded member Charles Tart to change his vote, leaving the group deadlocked 3 to 3. Attempts were then made to rename Mishlove's degree "the sociology of parapsychology" or "the folklore of parapsychology," but they were unsuccessful.

At that point, Morris resigned from the committee, feeling that Mishlove's latest work had "showed such poor judgment that I questioned whether he deserved a degree in any field." Seven months later, in June 1979, Pisani also left the committee in disgust, after a heated argument with Tart. The committee—now devoid of the two strongest critics—eventually approved Mishlove's revised dissertation and recommended him for a Ph.D. in parapsychology.

The affair has left a dark cloud over what Mishlove and JFK University had publicly hailed as a historic event. Mishlove, for his part, says the criticisms related in the article are based on documents, assembled by Pisani, that contain "many blatant errors and distortions" and in some cases contrived "erroneous facts." He says the level of criticism "must not be uninformed and misrepresent what is actually taking place."

How it will all end was not even certain. When the SKEPTICAL INQUIRER made an inquiry to Mishlove about the status of his degree this past spring, he supplied a document from the University of California confirming that he had been recommended for a Ph.D. in parapsychology. According to Rice's article, the granting of Mishlove's Ph.D. was being "reexamined" by the university, but, said the dean's office, it "will probably be approved."

—*K.F.*

CSICOP establishes a new Paranormal Health Claims Subcommittee

The Executive Council of CSICOP has announced the formation of a new subcommittee to examine paranormal health claims. Its scope will include faith healing, medical astrology, palmistry, psychic surgery, radiesthesia, aura readings, past lives therapy, and other occult practices, such as witchcraft, voodoo, and hexing.

There has been an enormous increase in claims that these practices help people. The public has a right to know whether such claims are hoaxes or can be validated by competent medical scientists.

The new committee will be chaired by William Jarvis, Ph.D., and Stephen Barrett, M.D., two of the nation's most active investigators of quackery. Dr. Jarvis, a consumer health specialist, is associate professor of preventive and community dentistry at Loma Linda University and president of the California Council Against Health Fraud,

Inc. Dr. Barrett, a practicing psychiatrist, is board chairman of the Lehigh Valley (Pa.) Committee Against Health Fraud, Inc., and editor of *The Health Robbers—How to Protect Your Money and Your Life.*

Other members of the Paranormal Health Claims Subcommittee are Richard Lane, M.D., chief of the Department of Nuclear Medicine, Ellis Hospital, Schenectady, N.Y.; Jack Provonsha, M.D., Ph. D., Loma Linda University; Robert J. Samp, M.D., University of Wisconsin Medical Center; Wallace I. Sampson, M.D., a hematologist from Mountain View, California; Elie Shneour, M.D., Ph.D., biochemist, Biosystems Research Institute, La Jolla, California; and William A. Nolen, M.D., a Minnesota surgeon whose two-year study of Kathryn Kuhlman and other faith healers was reported in his *Healing—A Doctor in Search of a Miracle.*

According to Dr. Jarvis, the new subcommittee will deal with claims of healing and health enhancement that supposedly transcend existing scientific concepts and theories. "Our first task will be to develop yardsticks by which such claims can be judged. Cases will then be evaluated by medical experts and other investigators and the results will be made available to the public," he said.

"Our task will not be easy," Dr. Barrett added. "Occult claims are often like clouds. From a distance they may appear solid. But the closer you get, the harder it is to be sure what you are looking at."

—*Paul Kurtz*

British and French sections of CSICOP meet

The British and French sections of CSICOP held meetings this past summer and I was fortunate to be able to attend both sessions.

Bernard Dixon, the newly elected chairman of the British Section, is the European editor of *Omni* and former editor of *New Scientist.* The executive secretary is Michael Hutchinson.

Although paranormal claims are widespread in Great Britain, our British colleagues think that the craze is stronger in America because Britain is "always behind the times"—but they believe that Britain is catching up fast. As in the United States, the mass media there have begun to exploit the paranormal by presenting the public with uncritical treatment of paranormal claims. The traditional British empirical heritage is highly skeptical, but at the same time there has always been a strong interest in psychical research. British intellectuals have long been associated with it, especially since the founding of the Society for Psychical Research in 1882, and today there are many strong proponents of paranormal claims, such as Brian Inglis, John Hasted, John Beloff, and Arthur Koestler.

Members of the British Section have been active in presenting the case for skepticism. Recently BBC-TV devoted two programs to astrology. Jeremy Cherfas, associate editor of *New Scientist,* represented the CSICOP on one of these programs. The other was produced as part of the BBC-TV Horizon science series ("Nova" in the United States). Horizon recently interviewed Marvin Zelen, George Abell, Michel Gauquelin, and me on the so-called Mars effect.

Members of the British Section who are active in the investigation of psychic phenomena are Antony Flew, Eric Dingwall, Christopher Scott, and Denys Parsons. Parsons and Scott (long-standing members of the British Society for Psychical Research) pointed

out that their skepticism was especially stimulated by the uncovering of fraud in the famous Soal case.

C. E. M. Hansel's book *ESP and Parapsychology* has been widely reviewed in the press, and Hansel, a psychologist and CSICOP Fellow, has voiced his skepticism on British television. Another member, David Berglas, a popular British magician, is in great demand by the media to expose paranormal hoaxes. Christopher Scott and Michael Hutchinson were called upon by Granada TV to test the Japanese "psychic" Masuaki Kiyota. Ian Ridpath, another member, is the author of many works on UFOs and space mysteries.

The meeting of the French Section of CSICOP was held in the editorial offices of the influential French magazine *Science et Vie.* This section was founded three years ago in cooperation with l'Union Rationaliste in Paris. At that time, I appeared on French national television, sponsored by l'Union, outlining the aims of CSICOP. Yves Galifret, executive director of the section, and Evry Schatzman, former president of the French Physical Society and director of the Nice Observatory, have been especially active.

The new chairman of the French Section is Maurice Gross, professor of linguistics at the Sorbonne. The secretary, Michel Rouzé, is the author of a new book skeptical of parapsychology and appears on the weekly radio program "French Couture." Alfred Kastler, Nobel Prize winner, is also a member. Bernard Dreyfus, of the Center of Nuclear Studies, and physicist Yves Farge conducted tests of Jean-Pierre Girard, in cooperation with James Randi, when he visited France two years ago.

Although France has long had a rationalist tradition and most intellectuals are skeptical of the claims of astrologers, psychics, and UFOlogists, UFOs are very popular with the public.

Other members of the French Section of CSICOP are: physicist R. Bonnet; biophysicist Henri Broch; Robert Clarke, a scientific journalist; psychologist P. Fraisse; Alain Ledoux, who is with *Science et Vie;* J. C. Pecker, an astrophysicist and member of l'Academie; Philippe Boulanger, editor-in-chief of *Pour la Science;* B. Cardo, a psychophysiologist; P. Cousin, editor-in-chief of *Science et Vie;* Dr. Held, a psychoanalyst; Dr. Larger, a physician and an illusionist; historian R. Mandrou; mathematician Dominique Perrin; geologist P. Renaud; statistician M. P. Schutzenberger; and mathematician Jean Manara.

—Paul Kurtz

In brief

Dick Smith, a well-known Sydney, Australia, electronics industrialist, donated $1,000 to help establish an Australian branch of the Committee for the Scientific Investigation of Claims of the Paranormal. The group is called the Australian Sceptic. Smith sponsored a recent public lecture and demonstration tour of Australian cities by CSICOP Executive Board member James Randi. A report from Randi on tests of psychic claimants he carried out during the tour will appear in a future issue of the SKEPTICAL INQUIRER.

—K.F.

Psychic Vibrations

The *Washington Post*'s resident astrologer, Svetlana Godillo, gave readers of that respected newspaper her predictions of developments in the 1980 presidential campaign. Her column of June 8, more than a month before the Republican convention, was titled "Predicting Reagan's Running Mate." She analyzed the astrological charts of the various candidates and found that "the chart of Rep. Vander Jagt leaps to the fore because of its numerous karmic links with Reagan and because of current heavy aspects." However, she concluded that Senator Howard Baker's chart was strongest of all. The name of George Bush was not mentioned in her column. On August 3, a week before the Democratic convention, she predicted that "because of that eclipse on Jimmy's chart [a few hours before the Democratic convention] I have strong doubts that he will emerge as the nominee of the party, especially in view of the fact that Mondale's chart is extremely strong and he is under the influence of another eclipse that is affecting his partnership." But she exonerated the president's brother Billy Carter, saying that it was "Libra's inaction," rather than Billy's action, that would bring about Jimmy Carter's downfall. When this downfall failed to happen, Svetlana had a ready excuse. On August 17, she explained that, if the Democratic convention had opened at 11 A.M. as planned, "a successful campaign would have been out of the question." But "the occupants of the White House must have read my column because by late last Sunday the opening hour was changed to 4 P.M. This decision eliminated the aspect of 'void of the moon.'" This put Libra at midheaven, a strong position for Carter. However, this chart "throws the current sun into the eighth house of death and taxes, and since the Sun rules the presidency, this puts Carter's presidency into its final days." She concluded that "Reagan's battle will be with John Anderson and . . . Carter will be out of consideration and out of the running."

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An unfortunately neglected presidential candidate is Allen Michael of Stockton, California, who heads up the New Age Synthesis political party. The *Omaha World Herald* reported that Michael's platform consists of a "world bill of rights," which he claims he was given during a visit to a flying saucer. Among the celestial wisdom given to this presidential contender by the space people: "Let each of us give to the extent of our abilities to the one world company and in return all things shall be added unto us . . . By printing, then

circulating free cash flow money . . . we will end unemployment, taxes, inflation, recessions and depressions forever."

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The *Weekly World News* reveals that "psychic and psychologist" Dr. Barbara Williams has found that "the Ayatollah Khomeni's mad lust for power is a carryover from his past lives when he ruthlessly tried to impose his will over others." Williams has also discovered that the Ayatollah had "several minor incarnations as a woman. Those lives were uneventful, as he was married and kept in the background by his husbands."

* * * * *

The tabloid *Modern People* has happened upon the story of the century, which they inexplicably chose to bury on page 46: "Vicious Bigfoot Raped Me & Made Me Pregnant." A woman in Oregon, identified only as "Tabitha," allegedly claims that while on a camping trip a 10-foot Bigfoot with enormously bad breath jumped out from behind the bushes. "I screamed. It grabbed me and I thought it was going to kill me. Instead it started to rip my clothes off, knocked me down and jumped on top of me." A pregnancy test has "confirmed the worst," according to the tabloid. The story ends: "Although the pregnancy and upcoming child delivery is a nightmare Tabitha will always live with, it will finally give the world a chance to see what probably is the world's first half-human, half-bigfoot baby."

* * * * *

Speaking of Bigfoot, Jon Beckjord of Project Bigfoot, one of the leading Bigfoot proponents in the U.S., had a letter published in the June 1980 issue of *Current Anthropology* pointing out that "investigators have been searching for and following up reports of dead sasquatch bodies for over 20 years, and not one has proven valid." But he explains that "the reason is not that the sasquatch doesn't exist; I am convinced that it does. Rather, it is that our field experiences have shown that it is paranormal." He then goes on to tell how this supposedly paranormal creature can allegedly be captured in photos and leave behind footprints indicating a weight of 2,448 pounds. Beckjord concludes that "while the sasquatch is here and among us, it is of a nature that cannot be measured by normal science . . . We may have to invent a para-anthropology to study what there is that can be measured of the sasquatch."

* * * * *

The *National Enquirer* reports that "a strange, tiny skeleton found on a deserted beach in Panama could be the remains of a space alien child." Panamanian psychologist Dr. Francisco Ramon de Aguilar, who has studied the skeleton extensively, speculates, according to the *Enquirer*, that "it could well be the remains of an alien baby, which may have fallen from a high-flying UFO." *Fate* magazine's Jerome Clark reports, however, that a similar skeleton found on a beach in Nicaragua proved to be part of a shark and that de Aguilar had to pay $1,000 for his specimen. Nonetheless, de Aguilar says that "it might be one of the most significant discoveries in history."

* * * * *

It's an ill wind that blows no one some good, and Mt. St. Helens' eruption has provided fertile ash, if not exactly soil, for wild speculations. Long-time UFO-

logist Robert Gribble, of Seattle's National UFO Reporting Center, told the *National Enquirer* that strange hovering craft were sighted in the vicinity of the mountain in the weeks before the explosions. Other experts linked UFOs and psychic experiences to various earthquakes and volcanoes. Not to be outdone, *Midnight/Globe* countered with a story claiming "Volcano May Have Driven Bigfoot East," citing some Bigfoot sightings in Ohio. (Actually, claims of Bigfoot sightings have for years been made in almost every state in the union.) That tabloid published a map showing a volcano in Washington blowing its top and a set of gargantuan footprints heading east toward Ohio.

* * * * *

Our favorite of the *National Enquirer's* recent headlines: "A Cross Between Human Beings and Plants. . . . Scientists on Verge of Creating Plant People." The article is illustrated by drawings of a "killer cactus" wearing infantry boots, said to shoot out "deadly seeds," and of "a tree recently discovered in Brazil that produces a kind of diesel fuel. It could be trained to fill up autos by itself." Other recent *Enquirer* headlines: "UFOs Terrorize Moscow"; "Polish Farmer Taken Aboard UFO by 'Little Green Men.'" The *Washington Post* reports that *Enquirer* editor Generoso Pope, Jr., demands a weekly list of "five great ideas" from his editors. Those ideas that do not impress him are rubber-stamped "NOT A BLOCKBUSTER." The Associated Press reports meanwhile that the *National Enquirer* faces a total of $57.5 million in libel damage suits by various entertainers, including Carol Burnett, Paul Lynde, Phil Silvers, Rory Calhoun, Ed McMahon, and Shirley Jones.

* * * * *

We have all heard stories of life after death. But the well-known parapsychologist Martin Ebon has claimed that not just life but earthly desires continue as before. "Enough first-hand experiences exist to show we continue to function as sexual beings long after we have died," Ebon told the tabloid *Midnight/Globe.* Ebon, former administrative secretary of the Parapsychology Foundation of New York, says that "the individual becomes totally helpless in resisting the possessing spirit, and that can result in all kinds of sexual encounters." Ebon has written the introduction to a new book by psychic R. DeWitt Miller, *By Lust Possessed,* whose author claims that "all communications from other worlds indicate that the sexual pleasure we experience in this life is only a gentle taste of the exquisite pleasures that wait for us after death."

* * * * *

The noted psychic Jeane Dixon is currently working on a book on astrology for cats, according to the *Washington Post.*

—*Robert Sheaffer*

Fooling Some of the People All of the Time

Experiments find preconceived belief a powerful force

Barry Singer and Victor A. Benassi

> *I shall fear no man, nor spirit except for the Lord our God, for he can destroy you and your soul and cast you into the pit where there is no rest from the eternal flame. You are in bondage to Satan and nothing can set you free apart from Jesus Christ. Can you see that you are in bondage?*
>
> —An experimental subject, in feedback to our performer.

Why do many people attribute occult powers to charlatans who perform old-hat magic tricks and label them "psychic"? People are often impressed by a "psychic" performer who appears to dematerialize ashes, to perceive through a blindfold, or to make a compass needle twirl by passing her/his hand over it. Yet any magicians worth their salt could not only perform these stunts, they could levitate bevies of assistants with a wave of the hand or dematerialize whole elephants onstage. Elephants seem much more difficult to dematerialize than ashes. That is, although professional psychics claim awesome powers, their actual "psychic" performances reduce to stunts that any amateur magician could perform. The fact that such amateur stunts compel many people to strong occult beliefs, then, demands explanation.

We constructed an experimental paradigm to demonstrate and explore this phenomenon (Benassi et al., in press). A student accomplice, Craig Reynolds, a talented actor and amateur magician, was asked to

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develop a standard magic routine that included "psychiclike" stunts. Craig was not informed of the purpose or the varying conditions of our experiment. To increase the ambiguity of Craig's performance, we dressed him in a purple choir robe, sandals, and a gaudy medallion (Fig. 1). Craig's performance was presented to six introductory psychology classes. The class instructors understood that they were cooperating in an experiment, but were unaware of its nature and purpose.

FIGURE 1. Magician who conducted "psychic" -like routine for students

In two of the classes, which we termed the "psychic" condition, the instructors introduced Craig's presentation as follows (Craig was waiting outside the classroom, out of hearing):

> Today I've agreed to allow one of our graduate students to give a presentation to you. His name is Craig Reynolds. Craig is interested in the psychology of paranormal or psychic abilities. He told me he's been working on developing a presentation of his psychic abilities and asked me if he could present it to you and get your opinions and reactions. I thought that would be interesting, even though I'm not convinced personally of Craig's or anyone else's psychic abilities, so I agreed to let him do it. He's a little late . . . I'm going to look outside to see if he's around.

In two other classes, termed the "magic" condition, the introduction was:

> Today I've agreed to allow one of our graduate students to give a presentation to you. His name is Craig Reynolds. Craig is interested in the psychology of magic performances and stage trickery. He told me he's been working on developing a presentation of his magic act and asked me if he could present it to you and get your opinions and reactions. I thought that would be interesting, so I agreed to let him do it. He's a little late . . . I'm going to look outside to see if he's around.

Upon entering the room, Craig performed the following routine. He passed out blank sheets of paper, explaining that he wanted written feedback on his performance. Craig did not label, interpret, or explain his performance. After asking the instructor to blindfold him thoroughly with numerous strips of masking tape and cloth, Craig attempted while blindfolded to read 10 three-digit numbers that had been written by volunteers from the class on ordinary notepaper. Craig had the capacity to read them all correctly; however, we instructed him to read four or five perfectly, come close on three and miss widely on the rest. Next, he selected a female volunteer from the class, whom he asked to sit immediately in front of him. After asking her to hold out her hands and clench her fists, he requested some cigarette ashes from an ashtray in the room. Craig smeared the ashes on the back of the woman's hands, then asked her to concentrate on relaxing and becoming immaterial. When he wiped the ashes off with a kerchief, he asked her to open her hands toward the class, and some of the ashes were seen to have been transferred to her palms. Finally, Craig passed around the class a sturdy, stainless-steel rod, challenging anyone to bend it by force. No one could. He then held it gently between his fingertips, stroked it softly with his index fingers, and asked the class to join him in chanting the word "bending." After a minute or two, the rod melted in his hand, reaching a 60-degree bend. Craig passed it back to the class for inspection and another try at bending it by force. Again, no one could bend it. All of the stunts described are easy amateur tricks that have been practiced for centuries and are even explained in children's books of magic. Craig asked for written feedback, collected the papers, and left the room.

When we inspected our data (the written feedback to the performer) we received two large surprises. First, there was little difference due to the experimental conditions (see Table 1). In both the "magic" and the "psychic" classes, about two-thirds of the students clearly believed Craig was psychic. Only a few students seemed to believe the instructor's description of Craig as a magician in the two classes where he was introduced as such. Second, psychic belief was not only prevalent; it was strong and loaded with emotion. A number of students covered their papers with exorcism terms and exhortations against the Devil. In the psychic condition, 18 percent of the students explicitly expressed fright and emotional disturbance. Most expressed awe and amazement. We were present at two of Craig's performances and witnessed some extreme behavior. By the time Craig was halfway through the "bending" chant, the class was in a terribly excited state. Students sat rigidly in their chairs, eyes glazed and mouths open, chanting together. When the rod bent, they gasped and murmured. After class was dismissed, they typically sat still in

TABLE I

Relation between instructional set and percentage of subjects who believed that the performer was a psychic or a magician

	Instructional Set		
	Psychic	Magic	Strong Magic
Response:	%	%	%
Psychic	77	65	58
Magician	14	17	33
Undecided	9	18	9
Total	100%	100%	100%
N =	75	51	52

their chairs, staring vacantly or shaking their heads, or rushed excitedly up to Craig, asking him how they could develop such powers. We felt we were observing an extraordinarily powerful behavioral effect. If Craig had asked the students at the end of his performance to tear off their clothes, throw him money, and start a new cult, we believe some would have responded enthusiastically.

Obviously, something was going on here that we didn't understand. Further, many students were experiencing serious emotional disturbance as a result of what we had done. Although in retrospect we might have known better, we did not imagine that having someone dress in a choir robe and do elementary-school magic tricks would produce such fright. We therefore took three further steps.

First, although we had originally planned to obtain demographic and personality measures from our experimental subjects three weeks after the performance, and only then debrief them, instead the experimenters and the performer went back as soon as possible to the classes where Craig had performed and fully explained to the students that they had been taking part in an experiment and had only been seeing tricks.

Second, we added several more conditions to our experiment. We thought that perhaps the classes had simply not heard or understood the instructor's initial description of Craig. To check this possibility, in three other introductory classes different instructors cooperated in presenting the magic and psychic descriptions at the start of class, and then immediately asked the classes to write down and interpret what they had just heard. Results showed that virtually all students heard and understood the descriptions, could define the word "magic" appropriately, and could

differentiate it from "psychic."

Next, we asked ourselves whether there was anything at all that their instructors could say about Craig in introducing him that would convince students that he wasn't psychic. We added a "strong magic" condition in two new classes, where the magic introduction was repeated with the following added: "In his act, Craig will pretend to read minds and demonstrate psychic abilities; but Craig does not really have psychic abilities, and what you'll be seeing are really only tricks." Thus the concept of "magic," "trickery," "pretend," are enunciated clearly six different times.

The use of this introductory description did succeed in reducing psychic belief slightly, but not to a level below 50 percent. Most of the students still believed Craig was psychic. We had two raters, ignorant of the purposes and conditions of the experiment, analyze all experimental protocols in random order. The results, shown in Table 1, indicate that, although our introductory cognitive "sets" did affect psychic versus magic beliefs at a statistically significant level, the most salient result was our inability to reduce psychic beliefs more than slightly through even strong and clear instructor descriptions of what was actually taking place. This says either something about the status of university instructors with their students or something about the strange pathways people take to occult belief.

We made a follow-up experiment with new introductory psychology students to get an indication of what was happening. After assessing the students' general psychic beliefs, we gave them a questionnaire containing a detailed written description of Craig's performance, which asked for their judgment of whether the performance demonstrated psychic powers. Fifty-eight percent of the students were fairly sure that Craig had psychic powers, and their judgment correlated with their prior psychic belief, which was generally quite strong.

The next question asked was whether magicians could do exactly what Craig did. Virtually all the students agreed that magicians could. They were then asked if they would like to revise their estimate of Craig's psychic abilities in the light of this negative information that they themselves had furnished. Only a few did, reducing the percentage of students believing that Craig had psychic powers to 55 percent.

Next the students were asked to estimate how many people who performed stunts such as Craig's and claimed to be psychic were actually fakes using magician's tricks. The consensus was that at least three out of four "psychics" were in fact frauds. After supplying this negative information, they were again asked if they wished to revise their estimate of Craig's psychic abilities. Again, only a few did, reducing the percentage believing

that Craig had psychic powers to 52 percent.

To summarize: our students initially were fairly sure that Craig was psychic; immediately afterward they themselves furnished information in logical contradiction to this judgment. They agreed that magicians could do exactly what Craig did and that most people who, like Craig, called themselves psychic were actually phonies. One could not then logically estimate that Craig was the real McCoy. In several other studies we have found results essentially similar to those described above.

What does all this add up to? The results from our paper-and-pencil test suggest that people can stubbornly maintain a belief about someone's psychic powers *when they know better.* It is a logical fallacy to admit that tricksters can perform exactly the same stunts as real psychics and to estimate that most so-called psychics are frauds and at the same time maintain with a fair degree of confidence that any given example (Craig) is psychic. Are we humans really that foolish?

Yes, In fact, a plethora of recent psychological research indicates that we are typically inept at reasoning through even the simplest conceptual task involving alternative hypotheses or probability (Nisbett and Ross 1980). And once we've chosen an incorrect hypothesis, we can stubbornly persist even when hints to problem solution or the correct hypothesis are placed in front of our noses (Chapman and Chapman 1967; Kammann 1980). Our results differ from previous psychological research on reasoning deficiencies only in showing an especially stubborn and dramatic resistance to the obvious truth.

There are further hints in our data that information processing deficits were occurring. In searching the data protocols from our initial experiment, we found only a few cases out of almost two hundred where students acknowledged what their instructor had said, and only two cases in the magic conditions where they explicitly recognized that their psychic beliefs contradicted their instructors' assertions. Rather than resisting or denying the contradictory information, which we know they heard and understood, students blindly ignored it. This is a typical information processing effect.

There is more to the story. We believe other factors abetted the serious reasoning problems our subjects experienced. First, we know from previous surveys (Benassi and Singer, in press), and from surveys we made of subjects in follow-up experiments, that most students entered our experiments having existing psychic beliefs. These initial beliefs probably channeled their thinking and prevented them from reasoning clearly about alternative hypotheses. For instance, in our follow-up experiments we asked our subjects to write a justification of their final probability estimates of the psychic qualities of Craig's performance. The most frequent

justification cited was prior belief in psychic phenomena, and in these cases subjects typically made mention *only* of prior belief. That is, they seldom mentioned anything at all about the particular case they were supposed to be judging. For instance, the complete justification of one subject who estimated that Craig was psychic was: "My justification for the answer is I am a Christian and I feel strongly that ESP or anything dealing with that is of Satan. Yes, I believe it could happen, *but* I, being a Christian, will have *no* part of it."

Second, especially in our initial experiment, the input from the instructor was brief, verbal, and cognitive, while Craig's actual performance was relatively long, live and in person, and dramatic. We would then expect the latter to be more vivid or "available" (Nisbett and Ross 1980) when subjects are fishing for interpretations of the experience. Since many subjects had prior psychic beliefs, and since we deliberately had Craig dress and act ambiguously—somewhere between a stage magician with top hat and tails and Uri Geller—the hypothesis that he was psychic would have been especially likely to be formed and supported.

Some alternative explanations that have been offered for our results are that the students were putting us on, or merely cooperating out of politeness with the performer's perceived desire to be judged as psychic. These explanations will not hold water. Neither in their protocols nor in their debriefing did a single subject hint that they knew that Craig's performance was part of an experiment. Their noticeable emotion during the performance showed that they were genuinely involved and taken in by the experience. Neither Craig nor the class instructors knew what the experiment was about. Craig at no point labeled himself as psychic or made explicit psychic claims. Far from being "polite" or supporting Craig's alleged self-ascription out of a desire to please him, those who were most convinced often vehemently accused Craig of being in league with Satan. In the week following the experiment, a number of direct observations and informal anecdotes revealed that students who witnessed Craig's performance were expressing their enthusiasm and amazement to other students who had not been in the classes.

Another alternative explanation for our results is the "California Hypothesis": California is chock full of nuts and anything could be believed there—it would never happen at Yale. To the contrary, the number one state in terms of cult membership per capita is Nevada (Stark and Bainbridge 1980). Students at California State, Long Beach, cluster around national norms in intelligence and academic achievement, and average several years older (24) than most undergraduate populations. Further, our experiment has been replicated by us and by colleagues at UCLA and Ohio State University, with very similar results (Padgett,

personal communication). And a similar result, where bizarre beliefs about their own psychic abilities were experimentally induced in students, has in fact originated from Yale (Ayeroff and Abelson, 1976).

We believe that our results, as bizarre as they may be, are of wide generality and that the psychological processes we have tentatively identified as being involved in supporting psychic beliefs are present and active in the general population.

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Self-perpetuating beliefs

What happened and what we think happened are often not the same thing. What we see is partly determined by what is going on in our heads at the time of observation and afterwards. Our perceptions are shaped by our expectations, our beliefs, our motives, our past experiences . . . Our beliefs are not automatically updated by the best evidence available. They often have an active life of their own and fight tenaciously for their own survival. They tell us what to read, what to listen to, who to trust, and how to explain away contrary information. . . .

People cannot always predict, however, what they will read or hear, and they often end up facing information that does not agree with their views. In this case, they fall back on a second line of defense—they actually misperceive or misunderstand the data. Whenever a person misreads unfavorable or neutral evidence as giving positive support to his beliefs, we say that he has found or made a *subjective validation* . . . Subjective validation is a pervasive human fallacy.

—Richard Kammann, in *The Psychology of the Psychic* by David Marks and Richard Kammann (Buffalo, N.Y.: Prometheus, 1980)

Recent Developments in Perpetual Motion

The energy crunch breathes new life into the perpetumania movement

Robert Schadewald

"Amazing New Motor Powered Only by Permanent Magnets," proclaimed the cover of the Spring 1980 *Science and Mechanics* magazine. "15-Hp Output Drives 5000-Watt Home Generator." The cover illustration shows a cutaway view of the marvelous magnetic motor, which is connected to a generator by a V-belt. The device is a classical perpetual-motion machine.

Many people seem to think that the search for perpetual motion ended in failure long ago. They are half right. Failure is perpetual, but there's no end to the search. Indeed, the modern energy crunch has brought renewed interest. Backyard mechanics and others with considerably more sophistication have been dusting off rusty old ideas and giving them new coats of paint. Investors line up, checkbooks in hand.

Modern inventors usually reject the term "perpetual motion." They prefer to talk about tapping energy sources not yet understood. Nevertheless, they direct their efforts toward violating either the first law of thermodynamics (conservation of energy) or the second law (principle of increasing entropy).

I have files on nearly a dozen recent perpetual-motion schemes. The three I will discuss here, the "amazing magnet motor" and two others, are all perpetual-motion machines of the first kind.

Robert Schadewald is a free-lance science writer with a special interest in offbeat claims.

When I first began reading the *Science and Mechanics* article about the magnetic motor,[1] I suspected that it was a sophisticated parody. Howard Johnson, inventor of this marvelous motor, makes the obligatory attack on scoffing scientists and then suggests that his device might derive its energy from a "previously unnamed atomic particle." But neither Johnson nor writer Jorma Hyypia is kidding. Indeed, U.S. Patent #4,151,431, issued to Johnson after a long battle with the Patent Office, protects the principle of the device.

"Principle" is the key word here, for the motor shown on the cover and first page of the article doesn't exist. Instead, Howard Johnson has some crude devices that he claims illustrate the principle by which such a motor could be built. The models consist of arrays of permanent magnets held together with "sticky tape and aluminum foil."

Two of the devices are linear arrays. The more sophisticated of these has the magnets mounted below a horizontal section of model-railway track. A model flatcar carrying magnets and a weight forms the moving part of the device. According to Hyypia, "The weight is needed to keep the vehicle on the track, against the powerful magnetic forces that would otherwise push it askew." When he placed the car on the track, Hyypia could "feel the powerful magnetic forces at work." The little car zipped off the end of the track when he let go.

Johnson also has a device made of vertically mounted magnets arranged in a circle on a turntable. When a hand-held "focusing magnet" is positioned inside the circle, the device begins rotating. Hyypia writes that for the demonstration he held the focusing magnet at least four inches away from the ring magnets. When the focusing magnet was reversed, the turntable rotated in the opposite direction.

Besides photographs of these three devices, the article contains a drawing of yet another device, slightly different. Thin, wide magnets are mounted, south pole down, to a high permeability support plate. These stator magnets, mounted in a linear array, have spaces between them that (confusingly) vary in different parts of the illustration. An arcuate armature magnet is shown moving above them from right to left with the "complex magnetic forces interacting to create off-balance effects." A table is given showing the field strengths between the poles of the armature magnet and the stator magnets in various positions. The table also shows a "constant off-balance situation," according to its caption.

This last device, with its support plate bent into a ring, is essentially what is shown on the cover of the magazine. It is the magnetic analog of the classical overbalancing wheel.

As it happens, I personally invented the paradigm of overbalancing wheels, whose design I magnanimously assigned to the public domain as of

April 1, 1978.[2] The Schadewald Gravity Engine, based on Dirac's conjecture that the universal gravitation constant G is in fact decreasing, is both simpler and theoretically more sound than Johnson's device. I sent a copy of my paper about the SGE to Joseph Daffron, editor of *Science and Mechanics*, informing him of this. He returned it with a bemused note.

Nearly three months later, assuming that the roof must have fallen in on *Science and Mechanics* as a result of their endorsement of a perpetual-motion machine, I called to verify my suspicions. I was in for a surprise. Associate editor Stephen Wagner informed me that the writer, Jorma Hyypia, was a former research scientist and that they were confident of his judgment that nothing was amiss. He said they intended to publish a follow-up on Johnson's device as soon as there was something to report.

I finally reached Howard Johnson by phone. Among other things, I asked him how long he thought the motor he was proposing would run. He replied that there seemed to be no sign of deterioration in the magnets he had experimented with. What does that have to do with anything?

"Some folks have come up with the idea that you can only get as much energy out of a magnet as it took to magnetize it," Johnson told me. "I don't think that has anything to do with it. The energy you're using is not the energy you used to magnetize it. You're using the energy of the electron spins, which were already spinning before you did anything. You only aligned them."

"But doesn't the whole idea smack of a free lunch?" I asked.

"We don't advertise any free lunches," he said, "and we don't advertise perpetual motion, either. Because that's a term you only use when you want to insult somebody. When you talk about nuclear energy, you don't hesitate to believe that it lasts for a long time. This isn't any more remote than that."

Apparently there are manufacturers who don't consider it remote. Though he doesn't deal with individuals, Johnson is already licensing his invention to corporations. He wouldn't name names, but he told me that he was considering a *down payment* of $5 million offered by one potential licensee.

"I think some of the companies getting under way will be merchandising within 18 months," he said. "Some of that depends on how fast they can get the proper kind of magnets so that it won't be prohibitively expensive. Motor-generator sets will probably be the first thing."

The day such a motor-generator set goes on the market, I will eat my best shirt without catsup. I will also take out a full-page ad in the SKEPTICAL INQUIRER apologizing for my rejection of Johnson's invention and my acceptance of the first law of thermodynamics.

Meanwhile, I don't profess to know how Johnson's models work.

Jorma Hyypia's description of the forces encountered in placing the car on the linear track suggests that doing so puts energy into the system. It is therefore not surprising that the car takes off when released. As for the rotating array of magnets, I can't offer an opinion without examining it.

Magnetically powered perpetual-motion machines are, of course, old hat. But perhaps the oldest perpetual-motion schemes involved attempts to make a water-wheel pump its own water while also providing an energy output.

Want to buy a "self-contained hydroelectric power system"? Sometime late in 1977, Mid America Dairymen, Inc., one of the nation's largest dairy co-ops, put up a reported $150,000 for a one-third interest in such a system.

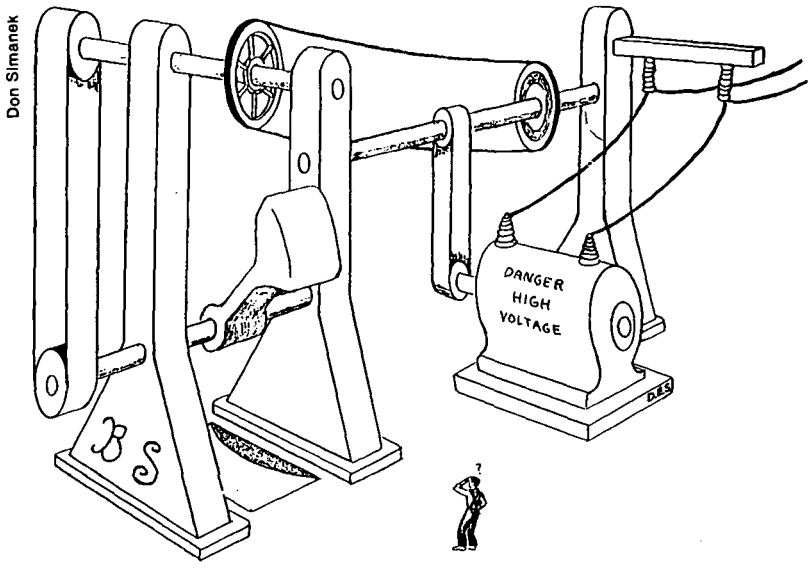
Inventor Arnold Burke came to Mid Am's attention in a magazine article about another one of his developments. According to the article, Burke claimed to have a 94-horsepower engine that used a special catalyst to burn oxygen and nitrogen, recycling the exhaust gases and burning them again and again. When he was approached about the engine, however, Burke claimed that it needed a lot of development work. Then he told them about his hydroelectric system, which he said could be ready for the market in a very short time.

Picture a 100-gallon water tank mounted on an 18-foot tower. Water flows down from the tank through the coils of an "amplification unit" and into a small water turbine. The turbine drives a generator, producing electricity to charge a battery pack, which in turn powers a solid-state 120-volt AC converter. Discharge water from the turbine flows into a *self-acting* pump, which then pumps the water up into the tank without using any energy!

Mid Am officials thought that such a system would be the answer to farmers' soaring electricity bills. Burke claimed that, retailing for about $1,500, the system could produce 1,500 (later revised to 3,000) kilowatt-hours per month at a cost of only 50 cents a month for bearing grease. He claimed that the key to the system, the self-acting pump, was something he'd invented years before to drain a gold mine in Colorado. The rest of the components could be purchased off the shelf. He didn't have a prototype, but with a laboratory and a little seed money—.

Redel, Inc., was organized with Arnold Burke as president, chairman of the board, and majority stockholder. Burke built a laboratory in Temple, Texas, and began work on a prototype.

Mid America Dairymen wanted to keep a low profile while the system was in the developmental stage, but that was not Arnold Burke's way. Burke sought out television personalities and writers who could give him



The Schadewald Gravity Engine coupled to an electric generator. There seem to be a few aspects of engineering design that could be improved here.

publicity. Steve Prentice, a Texas writer, wrote several enthusiastic stories for national farm periodicals.[3] One of these, in *Farm Show* magazine, came to my attention in August 1978.[4]

Since I live about 1,200 miles from Temple, Texas, I began doing what investigation I could by phone. Through a stroke of luck, I made contact with a Texas journalist, Deborah Weathers, and interested her in the story. She interviewed Arnold Burke, "admired" his machine, and gathered background information. By November 1978, we had the *real* story of the "self-contained hydroelectric system," only to discover that nobody cared!

We finally sold a carefully worded article to the *Minneapolis Star* (for less than our long-distance expenses).[5] In it, we gently suggested that the self-contained hydroelectric power system might not be all that Mid Am hoped it would be. I also called Mid Am and gave them some information I couldn't (and still can't) print.

As an exposé, our story fell flat. I got letters from two people who wanted me to examine and write about *their* machines and a nasty call from Mid America Dairymen informing me that I had "done them wrong" and that they still had full confidence in Mr. Burke and his machine.

By this time, it was some months since Arnold Burke had promised to deliver a "proof-of-concept" model of the machine to Mid America Dairymen's Springfield, Missouri, plant. This device, sealed so as not to reveal the secret of the "self-acting pump" to Mid Am personnel, was supposed to be set up in the middle of the plant and to start operating.

Then Burke would leave, and the machine would put out its rated power for 30 days without anyone touching it.

But instead of a proof-of-concept model, Mid Am got nothing but excuses from Burke. For a machine that was supposedly being built mostly from off-the-shelf parts, it seemed to take an eternity to finish. Finally, after several more months of delays, Burke and Mid Am parted company and Burke began telling people he would never again deal with big companies.

The Texas attorney general's office looked into Burke's relationship with Mid Am in 1978, but since Texas consumer laws don't protect corporations they dropped the investigation. After the break with Mid Am, however, Burke began selling distributorships for his device to individual investors. In November 1979, the Texas attorney general filed a civil action alleging that Burke and his associates had collected $800,000 in licensing fees under false pretenses, and asking for an injunction prohibiting further marketing of the machine.

By this time, the device was no longer just a "self-contained hydroelectric power system." Burke had christened it "Jeremiah 33:3," claiming that this Bible verse—"Call unto me, and I will answer thee, and shew thee great and mighty things, which thou knowest not"—was his inspiration for inventing the machine. Many of Burke's Bible Belt investors were as impressed by his piety as by his mechanical ingenuity.

The trial of Jeremiah aroused tremendous public interest in Belton County, Texas, and the courtroom was packed with Burke's investors and supporters. Here, his flair for publicity stood him in good stead. At one point, he pulled up a flat-bed truck loaded with machine components in front of the courthouse, and court convened on the lawn for a demonstration. Jeremiah, however, remained in the lab. Burke refused to reveal Jeremiah's secret, and his attorneys vigorously resisted a motion to have a court-appointed expert examine it. They lost.

On Wednesday, December 19, a court-appointed engineer began taking Jeremiah's pulse with an amplified stethoscope. He concentrated on a metal box in the lower tank of the machine, which Burke refused to open on the grounds that it would reveal his yet-unpatented secrets. In the course of the examination, Assistant Attorney General Roy Smithers found a concealed wire leading from the machine's upper reservoir.

From then on, it was all downhill for Jeremiah. Followed in one direction, the wire led via a circuitous route to a battery pack concealed under a bunk in an adjoining room. In the other, it led to an electric pump concealed in Jeremiah's guts.

Arnold Burke was arrested on the spot. The next day, the court froze his assets and issued an injunction prohibiting him from further marketing

the machine.

But many of Burke's investors did not lose faith. They insisted that Burke had only installed the electric pump to prevent the court-appointed expert from discovering the real secret of the machine. The attorney general had difficulty finding someone to sign a complaint, but two investors finally did so in early January, and Burke was indicted on two counts of theft of over $10,000. Eventually, there were six more indictments on the same charge. The attorney general added two counts of perjury, based on Burke's testifying under oath that Jeremiah required no external source of electrical power.

Arnold Burke's first trial, on one count of fraud, began in late May 1980, with the courtroom in Belton, Texas, reportedly packed with his admirers. It ended with the jury deadlocked 11 to 1 for conviction. During the trial, Burke's supporters raised another $250,000 and bought out disgruntled investors for 66 cents on the dollar!

The futures of Arnold Burke and Jeremiah remain clouded. Burke was scheduled for retrial. He insists that he will be vindicated. His assets are no longer frozen, although he is still enjoined from selling any further interests in the machine. He is reportedly hard at work in his laboratory making improvements in Jeremiah's design.

Neither Jeremiah nor the Johnson device will ever reach the market. Some perpetual-motion machines do, however. Consider the Frenette Friction Furnace.

The Frenette Friction Furnace produces heat using two concentric metal drums with heavy oil between them. When the inner drum is turned by an electric motor, the oil heats up. It doesn't take a post-doctoral fellow in thermodynamics to figure out that the device will convert essentially 100 percent of the electricity it uses into heat, much of it probably put out by the coils and bearings of the electric motor. A common electric resistance heater will accomplish precisely the same conversion at a fraction of the cost and with no moving parts.

Why do I call it a perpetual-motion machine? Because before the device went into production, inventor Eugene Frenette claimed that a 200,000 Btu model could be built that would plug into a "regular electric outlet." That claim allows a simple calculation. Wall outlets are wired for either 15 or 20 amperes, but they can handle only 80 percent of that current as a sustained load. Then 0.8 × 20 amps × 120 volts = 1,920 watts maximum sustained output, or 6,550 Btu per hour. Thus Frenette was in effect claiming an energy efficiency of at least 3,000 percent.

The Frenette Friction Furnace is currently being manufactured for, and sold by, Hedstrom/Powell Inc., of Des Moines, Iowa. In its literature, Hedstrom/Powell wisely claims only 100 percent efficiency for the Fric-

tion Furnace. But it also gives comparisons and testimonials suggesting that the friction furnace will produce the same amount of heat as a conventional electric heater while using substantially less electricity. And Lou Powell told me on the phone that their 3-horsepower unit will heat a 1,200-square-foot house, "much more than seems possible" from its Btu equivalent. Indeed!

The claims made for the Frenette Friction Furnace may seem plausible to those lacking a scientific background, but not the Johnson or Burke devices. Most people couldn't state the first law of thermodynamics on a bet, but they instinctively know that there's no such thing as a free lunch.

There is another sort, though, perpetually suspicious of power and authority. These people seem to think the laws of thermodynamics are part of the oil company plot to suppress the legendary 50 miles per gallon carburetor. If they don't seek perpetual motion themselves, they are prepared to accept someone else's "discovery."

I believe that the *persona* I assumed in my Schadewald Gravity Engine spoof in *Science Digest*—earnest, slightly paranoid, unselfish but still seeking recognition—is fairly typical of the breed. Certainly it struck a responsive chord with those readers taken in by the hoax, for they inundated me with letters, some bestowing upon me embarrassing accolades for my genius and generosity. The wording of most of the letters suggests that the writers were youthful or uneducated. But I also got two long-distance phone calls from engineers!

Clearly, the pursuit and acceptance of perpetual motion are not confined to the uneducated. Inventor Howard Johnson and writer Jorma Hyypia both have strong technical backgrounds. An engineer from Virginia Polytechnic Institute has endorsed Johnson's magnetic motor. The man who brought Arnold Burke to Mid Am has a degree in physics. And, at the civil trial of "Jeremiah 33:3," a chemistry professor from Arizona State University testified on behalf of the machine.

What's the prognosis for perpetumania? The hardcore believers are probably uncurable. As for the many others sometimes taken in, consider how it happens: The machines are often proposed or endorsed by people who apparently are experts. People see (or more likely read about) convincing demonstrations. The mass media publicize—and sometimes exploit—the wondrous new inventions. And scientists, hearing about them, usually shrug and go about their business instead of taking the time to counter the claims.

Haven't we seen this syndrome before?

Acknowledgments

Albert W. Kuhfeld, a physicist with the Science Museum of Minnesota, brought both the Johnson and the Burke devices to my attention.

Donald E. Simanek, professor of physics at Lock Haven State College, Pennsylvania, made several helpful suggestions about the Johnson magnetic motor.

Deborah Weathers, now an editor with the *Pine Bluff Commercial,* did most of the legwork on the original Burke story.

Jim Phillips of the *Temple Daily Telegram* covered the unmasking of Jeremiah 33:3 and filled me in on subsequent developments.

Notes

1. Jorma Hyypia, "Amazing Magnetic-Powered Motor," *Science and Mechanics,* Spring 1980, p. 45ff.

2. Bob Schadewald, "'What Goes Up' . . . Is Basis for a Breakthrough!" *Science Digest,* April 1978, pp. 9-10.

3. For instance, *The Dairyman,* April, May, July, and November 1978.

4. Steve Prentice, "'Breakthrough' System Promises Low Cost Electricity," *Farm Show* 2 (4) (1978).

5. Robert Schadewald and Deborah Weathers, "Electricity that's Penny-Cheap? Inventor's Scheme Stirs Up a Perpetual Commotion," *Minneapolis Star* Saturday magazine, December 2, 1978, pp. 12-13. ●

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Response to the National Enquirer Astrology Study

An independent experiment fails to replicate its results

Gary Mechler, Cyndi McDaniel, and Steven Mulloy

The January 22, 1980, *National Enquirer* proclaimed to its millions of readers in large red type: "Astrology Works—Test Shows Zodiac Sign Does Affect Your Personality." The article begins: "Astrology really works! In a remarkable, first-of-its-kind study commissioned by *The Enquirer*, an astounding 91 percent of 240 randomly selected persons proved that their personality is determined by their astrological sign." Apparently the study was carried out by the article's writers, John Blosser and John South. They requested their subjects to give their birthdates and then check off on a list of numbered but otherwise unlabeled personality descriptions (see Figure 1) the one that best described them. The writers claimed to have checked their procedures with astrologers and psychologists.

Since one of us (G.M.) discusses astrology in one of the Northern Kentucky University introductory astronomy courses, it was decided to use NKU students in a follow-up study of the claims made in the article. The primary claim, that 91 percent of the 240 subjects correctly recognized themselves in their choice of sun-sign descriptions, is the first we will respond to.

We offered the *National Enquirer's* sun-sign personality description list to 262 students. The day students were polled in class. Almost all were in general introductory courses. Thirty-two students were evening students

At the time of this study, Gary Mechler was visiting assistant professor of astronomy, Cyndi McDaniel was an assistant professor in the Psychology Department, and Steven Mulloy was a psychology student, all at Northern Kentucky University in Highland Heights. Mechler is now a visiting assistant professor in the Department of Physics and Astronomy at Bowling Green State University in Ohio.

Mark the *one* statement which best describes you.

_____I am a perfectionist, paying attention to small, important details that others often forget. I hate to let a job go until it is finished properly by my standards. Others may find me critical, but I am more critical of myself than of them. [Virgo]

_____I am an "easy touch" and would rather help people than make a lot of money, I enjoy daydreaming and usually get good results by trusting my intuition and following my hunches. [Pisces]

_____I am very interested in all of the creative arts, like writing, art and music. I like to settle arguments between my friends. I'm good at this, because I can see both sides of an issue. [Libra]

_____I am very good at business and making money, and I like taking charge and leading. I have my sensitive, emotional side, but I show this only to those closest to me. In public, I prefer to remain cool and collected at all times. [Capricorn]

_____I like to finish whatever I start, and my strong, determined personality makes me succeed. I can be jealous, but as a mate, I am very passionate. [Scorpio]

_____I like to create with words, either in writing or in speech and may sometimes monopolize conversations. However, my friends find me witty and interesting, if a bit fickle. I am usually logical and cool but change moods quickly and frequently. [Gemini]

_____Family is very important to me, and I want to have children. I feel happiest when I am at home with my family, pets and plants, and when I spend time cooking and decorating my home. [Cancer]

_____My mind is filled with new ideas, and I like to invent things. I like to feel that I am in control of my life, and running it in an organized, efficient manner. I like to learn and have a good memory for facts. [Aquarius]

_____I am very happy and cheerful, and I like making others happy. I am openly emotional and usually optimistic. I want my mate to cater to my every whim, but I am warm and generous in return. [Leo]

_____I am so enthusiastic about life that I am active at something all the time. I usually have five things going at once. If a project interests me, I will work long, hard hours on it. I love to talk and talk quickly, and I sometimes exaggerate. [Aries]

_____Once I make up my mind, I don't like to change it. I can be stubborn, especially when I know I am right, but I am too easygoing and quiet to get into arguments over anything. [Taurus]

_____My love of the outdoors and outdoor sports shows me to be a person who hates being tied down or restricted in any way. Freedom is what I need, and animals, travel and humor are the things I love. [Sagittarius]

FIGURE 1

in a Supervisory Development class, a rather more focused course. Their results were analyzed both together with and separate from the main body of day students.

In order to support the *National Enquirer* results, we would have had to have about 238 students choosing the personality description of their astrological sun sign. Our study resulted in 26 correct choices.

Now, from chance alone we would expect one correct choice in 12, or 8.3 percent correct choices. More correctly, to allow for random sampling errors, we would expect (95% of the time) to find between 5.0 and 11.6 percent correct choices from chance alone. For our sample of 262 students, that would translate to between 13.1 and 30.4 correct choices. Clearly, our result of 26 correct choices (9.9%) is within the range expected by chance alone, and the *National Enquirer* result of 91 percent is far beyond that range.

The *Enquirer* made further claims when breaking down its success rate by sign. Comparative results are shown in Table 1.

TABLE 1
Comparison of Success Rates in Enquirer and NKU Surveys

Best results claimed:	Enquirer	NKU
Virgo	100%	23.8%
Gemini	100	19.0
Worst results claimed:		
Cancer	85	9.5
Taurus	85	11.1
Sagittarius	85	19.0

In the NKU study, Virgo showed the best results, with 23.8 percent correct choices, and Pisces showed the worst, with 0.0 percent.

The 32 evening students in the Supervisory Development courses showed a different preference for choosing signs than did the more general day group, but the relative number of correct choices was identical. There were 3 correct choices out of 32, or 9.4 percent.

A few further comments on the distribution of choices may be of some interest. Table 2 shows the distribution of true signs (according to birthdate and the key provided in the *Enquirer* article), the number of times each sign was chosen, and the number of times each sign was correctly chosen. The dates defining the sun-sign periods were classical astrology dates; precession was not taken into account.

TABLE 2
Comparison of True Signs and Signs Chosen by NKU Students

	True signs	Times chosen	Times correctly chosen
Aries	22	16	1
Taurus	27	34	3
Gemini	21	15	4
Cancer	21	7	2
Leo	27	14	1
Virgo	21	36	5
Libra	20	15	2
Scorpio	20	20	1
Sagittarius	21	42	4
Capricorn	21	29	2
Aquarius	24	24	1
Pisces	17	10	0
Total	262	262	26

In case the reader noted the agreement between the *Enquirer* study and NKU study in that Virgo was represented by both as their most "successful" sign, perusal of Table 2 will put that coincidence in perspective. The Virgo sign was simply chosen more often by people of all signs. One would expect Virgos to reflect that fact. One can see by inspection the general correlation of the number of correct choices with the number of times that sign was chosen by all.

The favorite personality descriptions of the evening course people provided a fair profile of people who work during the days and take management courses at night. Their favorite choices were labeled Virgo (6), Scorpio (7), Capricorn (6), and Taurus (6). The remaining 7 subject choices were evenly scattered among the remaining 8 sun-sign personality descriptions.

Frankly, we did expect a greater-than-chance result. The reason is that astrology is popular and we expected many people to be familiar with their sun-sign personality description. In this regard 92.4 percent of our sample responded correctly to the statement "Give your astrological sun sign, if known." When asked the question, "Do you have at least some familiarity with the personality description for your sun sign?" 66.4 percent of 125 polled responded positively, and in fact two of our subjects who made correct choices were excluded from the tabulation of Table 2 because of comments they voluntarily wrote on their survey form. One comment was, "I know I checked the description of a Cancer person, but it accidently happens to be true"; and the other, "I have had my astrology chart drawn

up." Further, we might mention that the first comment is a demonstration of the psychological tendency of people to tend to be more accepting of information directed more specifically toward them, or, in other words, the "power of suggestion." We were prepared to analyze our results by looking for correlation of correct choice and the degree of positive attitude toward astrology, but when the results turned out to be exactly what one would expect from chance alone we decided not to bother.

This leads us to the final part of the NKU study—a survey of attitudes toward astrology. A total of 264 subjects responded to the request to check off the statement that most closely matched their own feelings. The results follow in Table 3.

TABLE 3
Attitude Toward Astrology

I feel that astrology is basically correct.	5.3%
I'm not sure, but I've seen some evidence in astrology's favor which impressed me.	27.7
I'm not sure, but I'm skeptical of astrology.	24.2
I do not feel that astrology is basically correct.	24.2
I have no feelings/knowledge on astrology.	18.6
Total	100.0% (N = 264)

The NKU study may be criticized on a demographics basis. The sample was local—not nationwide or worldwide. The sample should be random according to sex, but not age or race. Our sample, compared to U.S. averages, underrepresents older people and greatly underrepresents black people and other minorities. But it must be said that a correlation of attitude with age was looked for and not found. Further, the students did not volunteer. All students present in the classes utilized participated. And the courses the students were taking were quite varied and mostly introductory. The specialized evening course provided an internal check that showed that, although different personality descriptions were preferred by the evening students, their rate of correct choices was essentially identical to that of the more generalized day-student group.

Although extrapolations of our attitude survey to the general populace may not necessarily be very accurate, we feel that the basic rebuttal of

the NKU survey to the *National Enquirer* claims is unaffected by our sample selection. In this regard we should mention that we learned from the *National Enquirer* (private communication) that its survey was carried out on "a Florida state college" campus, though not all of the subjects were necessarily students. One may safely conclude that whatever sample limitations with respect to an ideally universally representative sample may be present in the NKU study are also present to a similar extent in the *Enquirer* study.

We could contact only one of the *Enquirer's* consultants, Dr. Harold Voth, senior psychiatrist at the Menninger Foundation in Topeka, Kansas. Dr. Voth informed us (private communication): "The *Enquirer* article tended to suggest I was a coinvestigator in the research . . . I was not . . . I did discuss the research design with an *Enquirer* reporter and concluded it was adequate. He contacted me for this purpose only." Dr. Voth went on to say that he was greatly surprised by the results. So were we, particularly after calculating the statistical odds for the *Enquirer* getting its claimed 91 percent correct-choice rate in a 240 subject sample. By chance alone, as we've said, one would expect 1 correct choice in 12. The results of the NKU study show that *only chance was involved,* with only negligible contamination in the results possible from people familiar with their sun-sign personality description. (Did the *Enquirer* check for this?) And from chance alone we can calculate the odds for the *Enquirer* results to be, shall we say, significantly less than one. They are, in fact, 1 chance in 680 million million billion billion trillion trillion trillion trillion quadrillion quadrillion quadrillion quadrillion quadrillion quintillion quintillion. ●

Quality of evidence

It is not the *quantity* of evidence that makes an idea correct, but the *quality* of the evidence.

—Richard Kammann, in *The Psychology of the Psychic* by David Marks and Richard Kammann (Buffalo, N.Y.: Prometheus, 1980)

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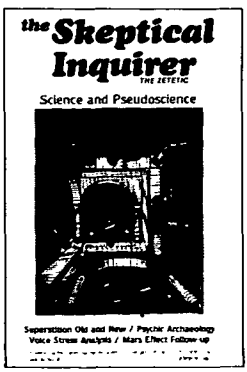

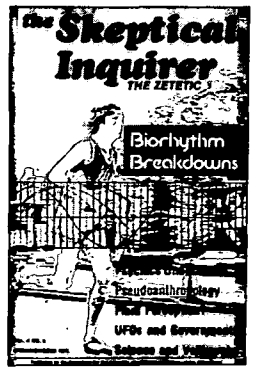

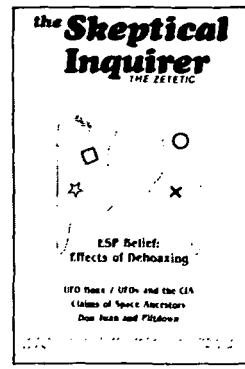

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Science and the Mountain Peak

The big-bang theory and the Genesis account of creation have virtually nothing in common, despite certain writers' attempts to pretend otherwise

Isaac Asimov

Some scientists are making their peace with theology. If we listen to them, they will tell us that science has only managed to find out, with a great deal of pain, suffering, storm, and strife, exactly what theologians knew all along.

A case in point is Robert Jastrow, an authentic professor of astronomy who has written a book called *God and the Astronomers.* In it and in recent articles such as "Have Astronomers Found God?" *(Reader's Digest,* July 1980) he explains that astronomers have discovered that the Universe began very suddenly and catastrophically in what is called a big bang and that they're upset about it.

The theologians, however, Jastrow says, are happy about it, because the Bible says that the Universe began very suddenly when god said, *Let there be light!*

Or, to put it in Jastrow's very own words: "For the scientist who has lived by his faith in the power of reason, the story ends like a bad dream. He has scaled the mountains of ignorance; he is about to conquer the highest peak; as he pulls himself over the final rock, he is greeted by a band of theologians who have been sitting there for centuries."

If I can read the English language, Jastrow is saying that astronomers were sure, to begin with, that the Bible was all wrong; that if the Bible said the Universe had a beginning, astronomers were sure the Universe had no

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beginning; that when they began to discover that the Universe did have a beginning, they were so unhappy at the Bible being right that they grew all downcast about their own discoveries.

Nothing in Common

Furthermore, if I can continue to read the English language, Jastrow is implying that since the Bible has all the answers—after all, the theologians have been sitting on the mountain peak for centuries—it has been a waste of time, money, and effort for astronomers to have been peering through their little spyglasses all this time.

Perhaps Jastrow, abandoning his "faith in the power of reason" (assuming he ever had it), will now abandon his science and pore over the Bible until he finds out what a quasar is, and whether the Universe is open or closed, and where black holes might exist—questions astronomers are working with now. Why should he waste his time in observatories?

But I don't think Jastrow will, because I don't really think he believes that all the answers are in the Bible—or that he takes his own book very seriously.

In the first place, any real comparison between what the Bible says and what the astronomer thinks shows us instantly that the two have virtually nothing in common. And here are some real comparisons:

1. The Bible says that the Earth was created at the same time as the Universe was *(In the beginning, god created the heaven and the earth),* with the whole process taking six days. In fact, whereas the Earth was created at the very beginning of creation, the Sun, Moon, and stars were not created until the fourth day.

The astronomer, on the other hand, thinks the Universe was created 15 billion years ago and the Earth (together with the Sun and the Moon) was not created until a little less than five billion years ago. In other words, for ten billion years the Universe existed, full of stars, but without the Earth (or the Sun or the Moon).

2. The Bible says that in the six days of creation, the whole job was finished *(Thus the heavens and the earth were finished, and all the host of them. And on the seventh day god ended his work which he had made).*

The astronomer, on the other hand, thinks stars were being formed all through the 15 billion years since the Universe was created. In fact, stars are still being formed now, and planets and satellites along with them; and stars will continue being formed for billions of years to come.

3. The Bible says that human beings were created on the sixth day of creation, so that the Earth was empty of human intelligence for five days only.

The biologist, on the other hand, thinks (and the astronomer does not disagree) the earliest beings that were even vaguely human didn't appear on the Earth until well over 4½ billion years after its creation.

4. The Bible doesn't say when the creation took place, but the most popular view among the theologians on that mountain peak is that creation took place in 4004 B.C.

As I've said, the astronomer thinks creation took place 15 billion years ago.

5. The Bible says the Universe was created through the word of god.

The astronomer, on the other hand, thinks the Universe was created through the operation of the blind, unchanging laws of nature—the same laws that are in operation today.

(Notice, by the way, that in these comparisons I say, "The Bible says . . ." but "The astronomer thinks . . ." That is because theologians are always certain in their conclusions and scientists are always tentative in theirs. That, too, is an important distinction.)

Theologians on Their Backs

These are enormous differences, and it would be a very unusual astronomer who could imagine finding any theologians on *his* mountain peak. Where are the theologians who said that creation took place 15 billion years ago? That the Earth was formed ten billion years later? That human beings appeared 4½ billion years later still?

Some theologians may be willing to believe this *now*, but that would only be because scientists showed them the mountain peak and carried them up there.

So what the devil is Jastrow talking about? Where is the similarity between the book of Genesis and astronomical conclusions?

One thing. One thing only.

The Bible says the Universe had a beginning. The astronomer thinks the Universe had a beginning.

That's all.

But even this similarity is not significant, because it represents a *conclusion*, and conclusions are cheap. *Anyone* can reach a conclusion—the theologian, the astronomer, the shoeshine boy down the street.

Anyone can reach a conclusion in any way—by guessing it, by experiencing a gut feeling about it, by dreaming it, by copying it, by tossing a coin over it.

And no matter who reaches a conclusion, and no matter how he manages to do it, he may be right, provided there are a sharply limited number of possible conclusions. If eight horses are running a race, you

might bet on a particular horse because the jockey is wearing your favorite colors or because the horse looks like your Aunt Hortense—and you may win just the same.

If two men are boxing for the championship and you toss a coin to pick your bet, you have one chance in two of being right—even if the fight is rigged.

How does this apply to the astronomical and theological view of the Universe? Well, we're dealing with something in which there are a sharply limited number of conclusions—more than a two-man prizefight, but fewer than an eight-animal horserace. There are, after all, just three things that might be happening to the Universe in the long run:

A. The Universe may be unchanging, on the whole, and therefore have neither a beginning nor an end—like a fountain, which, although individual water drops rise and fall, maintains its overall shape indefinitely.

B. The Universe may be changing progressively; that is, in one direction only, and may therefore have a distinct beginning and a different end—like a person, who is born, grows older (never younger), and eventually dies.

C. The Universe may be changing cyclicly, back and forth, and therefore have an end that is at the beginning, so that the process starts over endlessly—like the seasons, which progress from spring, through summer, fall, and winter, but then return to spring again, so that the process starts over.

A Myth Shared by All Mythmakers

If theologians or astronomers, or the shoeshine boy down the street, choose from one of these three by picking one of three different cards in a hat, they will each have a one-in-three chance of being right.

It is not, however, by sheer chance that a decision is usually come to in this case. All our experience tells us that various familiar objects have a beginning and an end. A loaf of bread is baked and finally is eaten; a suit of armor is fashioned and finally rusts; a human being is born and finally dies. For that reason, alternative B seems intuitively the likely situation with respect to the Earth and the Universe.

It is not surprising, then, that people generally think there must have been a beginning to the Universe, and that even theologians think so. It is not only our Biblical theologians who think so, almost all mythmakers did. The world had a beginning in the Greek and Norse mythologies and, for that matter, in the Babylonian mythology from which the exiled Jews borrowed (with modifications) their own Genesis tale.

It is not only our theologians who are sitting on Jastrow's mountain

peak, but a whole melange of primitive bards and medicine men. Now, it seems, the astronomers also suspect that alternative B is correct, that the Universe had a beginning, and they are sitting on the same mountain peak.

But conclusions don't matter. The mountain peak means nothing, since you can get there by guessing. *What counts is the route one takes to the mountain peak.*

Theologians, mythmakers, legend-constructors, dreamers—all of them, *but not* scientists—derive their conclusions from intuition, or by whatever words you use to mean intuition—divine revelation, transcendental meditation, sudden enlightenment, dreams, inspiration. The words don't matter; they all mean that the conclusion is born from within one person.

But how can *you* check out a conclusion that comes from inside some other person? The results of one person's intuition cannot force another to believe. In other words, they are not compelling.

Oh, yes, the charismatic dreamer can sweep people along on a tide of emotionalism. He can convert them into armies and send them out to kill—or, as we have recently seen, to commit suicide. What's *that* got to do with the truth?

These hot-blooded attempts to find truth by intuition mean nothing to the intellectual history of humanity, except insofar as they have barred the way to an increase in our knowledge of the Universe and have succeeded in keeping us longer in the mire of ignorance.

Science—of which astronomy is one branch—is the one human endeavor that does not rely on intuition. Intuition pops up here and there on the road science travels, but the final decision on which branch to follow at each of an infinite number of intersections is based on careful observation and measurement of natural phenomena and deliberately arranged experiments. Deductions and inductions are made from those observations and measurements, according to the established and universally accepted rules of reason. What's more, everything is done in the open, and nothing can be accepted unless and until those observations and measurements are repeated—independently.

Even then the acceptance of a particular "truth" is never more than tentative. It is always subject to change, since further, better, and more extensive observations and measurements may be made, and more subtly reasoned inductions and deductions can lead to more elegant and useful conclusions.

The result is that, despite controversy in the preliminary stages (and the controversy can be acrimonious, emotional, ill-advised, or all three—for scientists are human beings, too) a consensus is eventually reached. Because arguments from reason *are* compelling.

What's more, scientists accept defeat. They may do so with poor grace, but they accept it. There are examples of this all through the history of science.

What counts, then, is *not* that astronomers are currently of the opinion that the Universe is changing progressively and therefore had a beginning. What counts is the long chain of careful investigation that led to the observation of red-shifts in galactic spectra (the lengthening of light-waves emitted by galaxies, which shows those galaxies are moving away from us) that supports that opinion.

Questions No Theologian Can Answer

What counts is *not* that astronomers are currently of the opinion that there was once a big bang, in which an enormously concentrated "cosmic egg" that contained all the matter there is exploded with unimaginably catastrophic intensity to form the Universe. What counts is the long chain of investigation that led to the observation of the isotropic radio wave background (shortwave radio waves that reach Earth faintly, and equally, from all directions) that supports that opinion.

So when the astronomer climbs the mountain, it is irrelevant whether theologians are sitting at the peak or not, if they have not *climbed* the mountain.

As a matter of fact, the mountain peak is no mountain peak; it is merely another crossroad. The astronomer will continue to climb. Jastrow seems to think the search has come to an end and there is nothing more for astronomers to find. There occasionally have been scientists who thought the search was all over. They are frequently quoted today, because scientists like a good laugh.

What was the cosmic egg and how did it come to explode at a particular moment in time? How did it form? Was there something before the big bang? Will the results of the explosion make themselves felt forever, or will the exploding fragments at some time begin to come together again? Will the cosmic egg form again and will there be another big bang? Is it alternative C that is the true explanation of the Universe?—these are only some of the infinite number of questions that those astronomers who are not convinced it is all over are interested in. In their search they may eventually reach new and better conclusions, find new and higher mountain peaks, and no doubt find on each peak guessers and dreamers who have been sitting there for ages and will continue to sit there. And the scientists will pass by on a road that, it seems possible, will never reach an end, but will provide such interesting scenery *en route* that this, by itself, gives meaning to life and mind and thought.

There is nothing to Jastrow's implication that astronomers are disturbed by the prospect of a big-bang beginning because, presumably, they hate to admit that theologians were on the mountain peak before them. This seems wrong to me.

In 1948, some astronomers (including the well-known Fred Hoyle) worked out a closely reasoned theory that made it seem that, despite the established notions of the existence of an expanding Universe, there were no big bang and no beginning; that there was an eternal Universe without beginning or end. The theory was called "continuous creation."

Did astronomers in general leap gleefully behind Hoyle, to thumb their noses at the theologians? Not at all. The majority were hostile. Evidence for the big bang was stronger than for continuous creation, and as time went on, the evidence for the big bang grew stronger still. Now the theory of continuous creation is just about dead.

Astronomers didn't hesitate to follow the trail of evidence to the big bang just because it might have led them to the theologians. I don't think many of them even dreamed of it as leading to them.

The Cyclic Universe

Then why are there anti-beginning feelings among astronomers, if not because of anti-theological bigotry? Because the results are not all in yet.

Considering the amount of matter in the Universe, as far as astronomers can now tell the Universe is going to expand forever. There was one big bang at the beginning and one infinite scattering at the end. That's it.

If, however, there should be about a hundred times as much matter in the Universe as astronomers think there is, then gravitation will be sufficiently intense to bring a halt to the expansion, force a gradual contraction, produce another cosmic egg and another big bang, over and over. This would be like a ball bouncing high, gradually brought to a halt in its upward climb by the pull of gravity, falling faster and faster, hitting the ground, bouncing upward again, and so on, over and over. In that case, alternative C, *not* alternative B, is the truth.

Frankly, I find such a cyclic Universe more emotionally satisfying (I am human; I have emotions) than a one-shot beginning and ending. My intuition, if you like, tells me that astronomers will find that missing matter and will decide that the Universe is cyclic and that there is no beginning after all and no ending, only endless repetitions, endless bouncings, endless pulsation.

That is only my intuition, I repeat, and what makes me a scientist is

that if the evidence in favor of a one-shot Universe continues to increase, I will abandon my intuition without a quiver. I have done so in other cases, as for instance when I opposed the drifting of the continents and then accepted it as more evidence came in. If, on the other hand, my intuition turns out to be correct, what happens to Jastrow's mountain peak?

No doubt Jastrow will hurriedly seek and find other Biblical quotations and quickly transport his theologians to some other mountain peak with instructions to say they have occupied it for centuries.

The scientific road is painful, hard, and slow, and to some (poor souls) the delights are not worth the effort. King Ptolemy of Egypt once asked Euclid, the mathematician, to instruct him in geometry, and Euclid undertook the task. Ptolemy grew restless at the slow progress, however, and finally ordered Euclid to make his proofs simpler.

"Sir," said Euclid haughtily, "there is no royal road to geometry."

But how tempting to seek the royal road when one can't face the mental perspiration of the tedious step-by-step. That's what makes intuition seem so delightful to most people ("Oh, don't give me your arguments. I just *know* . . .").

It even tempts Fritjof Capra, a physicist at the University of California who has written *The Tao of Physics.* He thinks, apparently, that what physicists have found out with great difficulty, Eastern sages have known all along. There's the old mountain peak.

Capra cites the Chinese notion of yin and yang, where yin represents the rational mode of thought and yang the intuitional, and believes them to be the "two sides of the same reality" or "polar areas of a single whole."

All right. No argument. Every scientist uses both reason and intuition in his attack on problems—but in the end the two are *not* equal. If intuition overwhelmingly suggests a conclusion, it still must be supported by reason, or else it is only soap-bubble speculation. If, on the other hand, the conclusion of reason goes against intuition, then reason must nevertheless be supported and intuition dismissed.

Capra seems to imply that they are equal, and he points out that modern physics, in probing into the most fundamental aspects of matter and energy, has come up with a picture in which the Universe seems to be "a continuous dancing and vibrating motion whose rhythmic patterns are determined by the molecular, atomic, and nuclear structures."

He then quotes a Taoist text to the following effect: "The stillness in stillness is not the real stillness. Only when there is stillness in movement can the spiritual rhythm appear which pervades heaven and earth." This, says Capra, is "exactly the message we get from modern atomic physics."

But what does the Taoist text mean? I can see that "stillness in movement" represents dynamic equilibrium and that it is the latter that is important in the Universe—but that is my *interpretation,* based on my knowledge of *science.* What did it mean to the fellow who first said it? And what other interpretations can be made of it by people who don't have my particular cast of mind?

Many Eastern sages have said many things in elliptical and obscure language, even in the original, which suffer further in the translation. Anyone as imaginative and dedicated as Fritjof Capra (or even someone more limited, such as myself) can go through the vast volume of Eastern sage-sayings and come up with remarks that can be interpreted to seem to match any scientific conclusion.

Capra says that all mystical traditions, East and West, agree with modern physics. Of course they do, if *one* person (Capra, for instance) undertakes to interpret selected scraps of statements from each of them in his own way.

And if modern physics changes its mind, as it has in the past when new evidence came in, what then? In that case, no doubt, one person (still Capra, perhaps) will find other scraps of mystical tradition and subject them to new interpretations and come up with another match.

But if intuition is as important to the world as reason, and if the Eastern sages are as knowledgeable about the Universe as physicists are, then why not take matters in reverse? Why not use the wisdom of the East as a key to some of the unanswered questions in physics? For instance:

What is the basic component making up subatomic particles that physicists call a quark? How many different quarks are there? What is the relationship between the intensity of their interactions and distance? Are the leptons—the lightest particles, such as the electron—made up of anything simpler? Are there any additional heavy leptons? How many: What is the relationship between quarks and leptons? And so on.

Physicists are attempting to find answers to these questions by using enormously expensive instruments to study cosmic rays and to promote high-energy particle interactions—that is, the smashing together of subatomic particles at enormous speeds to see what changes are produced. It would be much simpler to study Taoist texts for the answers. But if Taoist texts can only be properly understood after physicists reach the answers, then of what scientific use are the Taoist texts?

What nonsense all this supposed intuitional truth is, and how comic is the sight of the genuflections made to it by rational minds who lost their nerve.

No, it isn't really comic; it's tragic. There has been at least one other such occasion in history, when Greek secular and rational thought bowed to the mystical aspects of Christianity, and what followed was a Dark Age.

We can't afford another. ●

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Roots of coincidence

Koestler's fallacy refers to our general inability to see that unusual events are probable in the long run . . . It is a simple deduction from probability theory that an event that is very improbable in a *short run* of observations becomes, nevertheless, highly probable somewhere in a *long run* of observations . . . We call it "Koestler's fallacy" because Arthur Koestler is the author who best illustrates it and has tried to make it into a scientific revolution. Of course, the fallacy is not unique to Koestler but is widespread in the population, because there are several biases in human perception and judgment that contribute to this fallacy.

First, we notice and remember matches, especially oddmatches, whenever they occur. (Because a psychic anecdote first requires a match, and, second, an oddity between the match and our beliefs, we call these stories *oddmatches.* This is equivalent to the common expression, an "unexplained coincidence.") Second, we do *not* notice nonmatches. Third, our failure to notice nonevents creates the *short-run illusion* that makes the oddmatch seem improbable. Fourth, we are poor at estimating combinations of events. Fifth, we overlook the *principle of equivalent oddmatches,* that one coincidence is as good as another as far as psychic theory is concerned.

Our human ability to see positive cases and inability to see negative ones tends to put us all in the position of the fool who believed that everybody spoke the same language he did, because he had never met anybody who didn't.

—Richard Kammann, in *The Psychology of the Psychic* by David Marks and Richard Kammann (Buffalo, N.Y.: Prometheus, 1980)

Teaching Critical Thinking

How to foster a critical scientific attitude toward anomalous claims

Kas Mazurek and Brian Titley

Readers of the SKEPTICAL INQUIRER certainly do not need to be reminded of the astounding varieties of what *Time,* echoing Charles Fair, dubbed "the new nonsense" (Dec. 12, 1977). Astral travel, psychic surgery, telekinesis, psychic phototelepathy, demon possession—the list is seemingly endless. That adults are entertaining, and succumbing to, many paranormal and pseudoscientific beliefs is becoming commonly recognized *(Psychology Today,* Oct. 1973; Feb. 1976). The resurgence of general public interest in parapsychology, astrology, the occult, and magic *(Time,* June 19, 1972) has given the new nonsense more of a public forum and therefore greater significance. Newspapers report almost daily how UFOs abound all over our globe. Uri Geller continues to receive media coverage. The Amazing Kreskin is a recurring personality on television. "Bermuda Triangle" is a "household word," Pyramid power spawns lucrative new commerical enterprises. Sensational crimes are supposedly solved by psychics. Newspapers carry syndicated daily horoscopes, biorhythm charts, and psychics' columns. Occult-book sales boom. The permeation of these beliefs is so extensive that we can conceive of, to use a borrowed phrase, "the occult revival as popular culture" (Truzzi 1974).

What is often not fully appreciated is the tremendous effect these ideas have upon children and adolescents. It is the young who are the least

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discriminating consumers of popular culture; and, if that culture includes the new nonsense, then obviously a constant regeneration in the ranks of believers is occurring. Certainly journals such as the SKEPTICAL INQUIRER are doing a tremendous service in the cause of fostering balanced, critical thinking. But we are concerned that those most in need of analytic skills—the young—are only marginal recipients of such lessons. The objective of this article is to outline a simple, concrete method for fostering critical thinking that we have invariably found to be an educational, stimulating, and rewarding experience for the youth involved.

Children and adolescents are highly curious, enthusiastic, and imaginative. This, combined with the fact that they possess an intellectual capability still in the formative stages, makes them particularly susceptible to even the most bizarre claims of the advocates of the paranormal and the practitioners of the pseudosciences. Three main processes combine to give the new nonsense credence in the minds of youth. Hearsay is one culprit. Stories are passed around, the tales grow in exaggeration and inaccuracy, and then the myths become common and accepted knowledge. This is a well-known social-psychological phenomenon, and the influence of peer pressure is greatest in the early years.

Second, and of even greater concern, is the realization that many irrational beliefs appear to be wholly legitimately supported. In a media-dominated world, children who insist upon the actuality of the Bermuda Triangle, the reality of pyramid power, or the accuracy of astrological projections are quick to refer to having seen it on TV, having read it in a book, or having seen it in the newspaper. This presents a problem for skeptical adults. When the media uses such terms as "Bermuda Triangle" freely, they are, in effect, creating an air of legitimacy. Logically, children conclude that there must be some truth to the matter if they see it in their local paper.

But perhaps the firmest convictions are a result of personal experiences. The young dominate the audiences of, for example, touring magicians and hypnotists. Those who have seen a traveling hypnotist and experienced him or her directly are hesistant to deny that something truly extraordinary has occurred. In like manner, watching magic or ESP demonstrations on television is equated with personal experience. Children "see" the phenomenon for themselves, forgetting the intervention of the medium of television.

The unfortunate result is that skeptical adults become involved in a battle for credibility with their own children. Although we can perhaps easily counter the influence of beliefs based on mere hearsay, there is real difficulty in getting children to question the validity of media-reported instances of paranormal phenomena. Why, after all, would newspapers,

books, and television—the very tools adults use to illustrate and define reality for their children—suddenly be misleading? In the case of personal experience, all these difficulties obviously become compounded.

The end result is that children are exposed to frustration and psychological dissonance. They must "choose" between the affirmations of a skeptical parent, respected adult, or teacher and the seductive authority of media and experience. However, we can quite easily provide them with the tools to make such decisions—and in a way that will simultaneously entertain and inform them. One obvious place to foster such lessons is the school. It is to the school's role that Elmer Kral recently addressed himself in the SKEPTICAL INQUIRER (Summer 1979), and we heartily endorse the recent founding of the CSICOP Education Subcommittee. At higher levels of education, the Spring issue of this journal comprehensively reported on a method for lessening belief in ESP among university students ("Believing in ESP: Effects of Dehoaxing," by Scot Morris). Equally obvious, and as important, is the fact that individual parents have an obligation to foster critical attitudes in their children. Parents are free to, and fully capable of, exposing their children to skeptical, scientific thought with this simple method. One can even envisage the media using this technique as a format for documentary or panel-type programs, and formal debates are a tailor-made forum for implementing this method. And, of course, as a self-improvement program, the application is also straightforward.

However, since we, the authors, are educators and since the schools offer the greatest forum for a widespread application of the benefits of critical thought for children, we will place our ideas into the context of a classroom situation. We believe that the current popularity of the paranormal and pseudosciences can serve as the basis upon which teachers can develop a stimulating curriculum that will help foster a rational-scientific attitude. As we have reported elsewhere *(B.C. Teacher,* May/June 1979; Nov./Dec. 1979), teachers have a unique opportunity to use popular, readily available literature to initiate a curriculum unit on rational thinking and critical evaluation of information. Such a curriculum will expose students to both sides of arguments relating to pseudoscientific theories and belief systems. As a result, students will become familiar with the forms of argument and evidence employed by promoters of the paranormal.

Numerous classroom approaches may be employed. One idea is to have projects in which students study and evaluate the paranormal phenomenon of their choice. In this case, we strongly recommend that students be first exposed to works that support the pseudosciences, and later to those that debunk them. Alternatively, the teacher could assign pseudoscientific books to one group of students and critical rebuttals to another group. The inevitable result is a highly stimulating debate. And of course

more traditional approaches, such as allowing students individually to choose a paranormal phenomenon and then read specific supportive and critical material, may be utilized as circumstances warrant.

Whatever the strategy chosen, pedagogical technique is secondary to the educational objectives of this approach. In investigating the claims of the pseudosciences through both sympathetic and critical accounts, students must be made to realize that they are dealing with fundamental questions on the very nature of cognition: "How do we decide between conflicting sources of information?" "To what degree are there tendencies toward sensationalism (indeed, occasionally irresponsibility) in certain sectors of the media?" "What exactly constitutes acceptable evidence in constructing an argument?" "Precisely what are the advantages of a scientific-rational perspective?" Progressive educators are aware of the need to ask such fundamental questions. For example, Kelly and Crilly (1979), in an excellent short article addressed to the teaching profession, emphasize that "a critical intelligence is needed at the present time more than any other. The next generation will be called upon to solve problems of economics, overpopulation, and international strife of which our generation has only a hint" (p. 12). These authors identify five imperatives for developing critical inquiry that all teachers and parents would do well to heed (p. 13):

1. Impressing upon students the fact that the written word is not self-validating.
2. Providing adequate course and curriculum materials on the aims and objectives of science, that is, criteria for distinguishing science from pseudoscience: Is the theory testable? Falsifiable? Have independent investigators replicated their experiments successfully?
3. Being aware of the source of the information. What is the nature of the authority promulgating the viewpoint? What do other scientists say about the claims?
4. Questioning how well the observations and/or theory advocated fit in with the established structure of science. Extraordinary claims demand extraordinary evidence.
5. Familiarity with the persuasive techniques of rhetoric and logical fallacies frequently used by pseudoscientists.

Following are some of the fascinating topics students could cover from either a sympathetic or critical perspective; and then they could engage in a dialogue with peers and in a guided discussion with teachers or parents to achieve the aims listed above.

Ancient astronauts. Erich von Däniken's thesis that our ancestors were visited by superintelligent aliens who effected mankind's entry into

civilization has been popularized through worldwide sales of 34 million copies of *Chariots of the Gods?* (1971). Television and newspapers have added to the diffusion of this view. Ronald Story's *The Space Gods Revealed* (1976) is a readily available critical examination of both the logic and evidence von Däniken marshals.

Astrology. The widespread popularity of astrology is evidenced by the almost limitless literature promoting the belief that the position of heavenly bodies at the time of one's birth determines personality and influences the course of one's life. Students would probably find Dave Rudhyar's *The Practice of Astrology* (1968) and J. Manolesco's *Scientific Astrology* among the most convincing and readable pseudoscientific arguments in favor of astrology. The first chapter of Owen S. Rachleff's *The Occult Conceit* (1971) offers the most readable, wittiest, and hardest-hitting refutation of astrological claims. It is ideal for home or classroom, and we guarantee Rachleff's work will stimulate debate. (The rest of the book, which deals with witchcraft, tarot cards, etc., is also highly recommended.) For advanced students, parents, and teachers, more scholarly, but very concise, analyses and reviews are available, for example, I. Kelly, "Astrology and Science: A Critical Examination" (1979).

The Bermuda Triangle. This treacherous patch of watery geography has been the subject of an absolute overkill by the media. Leading the barrage is Charles Berlitz's *The Bermuda Triangle* (1974) and his more recent *Without a Trace* (1977). The classic rebuttal to Berlitz's sensationalistic claims is Lawrence D. Kusche's *The Bermuda Triangle Mystery—Solved* (1975). Because of the structure of Kusche's book, we strongly suggest that students first analyze Berlitz's account of an individual "disappearance" and then compare it to Kusche's explanation. This is, in effect, a case study that helps teach children to distinguish between shoddy and thorough investigation and to recognize the sensationalism of spectacular, unwarranted conclusions.

Biorhythms. The superficially scientific cloak of pseudoscience has perhaps reached perfection in the theory of biorhythms. Here is a real opportunity for young people to see just how blurred the line between science and pseudoscience can become. Thommen's *Is This Your Day?* (1973) should pretty well convince the uninitiated. To test biorhythms in the cold light of proper empirical research, the student is best referred to three articles in the SKEPTICAL INQUIRER: Terence M. Hines, "Biorhythm Theory: A Critical Review" (1979), William S. Bainbridge, "Biorhythms: Evaluating a Psuedoscience" (1978), and A. James Fix, "Biorhythms and Sports Performance" (1976). Biorhythm theory, because of its current great popularity, which we suspect has still not peaked, is a particularly stimulating topic for students.

T. Lobsang Rampa. The popularity of T. Lobsang Rampa's ideas is probably attributable to his alliance with Zen, meditation, and other fashionable manifestations of Eastern mysticism prevalent today. Since his first and best book, *The Third Eye* (1956), appeared, the occult/mystery shelves of bookstores have abounded with his works. A short and excellent section of Christopher Evans's *Cults of Unreason* (1974, pp. 244-255) will undermine converts' convictions. Evans's book is here recommended not only because Rampa's claims to possess powers as fantastic and varied as clairvoyance, telepathy, levitation, and astral travel need refutation but also because Evans does an excellent job of examining a variety of other cults and movements. Thus a lesson larger than the Rampa fraud is concisely presented to those most susceptible to the propaganda of North America's numerous cults.

Pyramid Power. Another exceptionally "scientific" pseudoscience is manifest in the pages of Max Toth and G. Nielson, *Pyramind Power* (1974), and Bill Shul and Ed Pettit, *The Secret Power of Pyramids* (1975). These writers claim that models made to the dimensions of the Great Pyramid of Egypt will harness "biocosmic energy" that is capable of retaining the sharpness of razor blades, keeping food from spoiling, enhancing plant growth, and even controlling pain, alleviating health problems, and increasing sexual satisfaction. Teachers may turn to Wayne Lilley's short article "The Pyramid Pushers" (1976) for a light, convincing refutation.

UFOs. And what is more imperative than helping students critically examine the UFO phenomenon? Today, much of our population is convinced that UFOs—that is, alien incursions into our world—are a "proven" fact of scientific life. Convincing evidence is offered in Emenegger's *UFOs—Past, Present and Future* (1974), Hynek and Vallee's *The Edge of Reality: A Progress Report on Unidentified Flying Objects* (1975), and Hynek's *The Hynek UFO Report* (1971). To combat this often very persuasive "evidence," we recommend Edward Condon, *Final Report of the Scientific Study of Unidentified Flying Objects* (1966) and Philip Klass, *UFOs Explained* (1974).

Use of the materials above, supplemented by conversation with teachers and parents, will go far toward the development of a critical attitude in students. Such a debunking of the pseudosciences has an intrinsic educational value, with important implications for the understanding of other subject areas and, coincidentally, for the understanding of wider reality. At the very least, we will have given our children some basic critical/analytic skills to help them to evaluate skeptically the almost endless barrage of the bizarre and the unlikely they will encounter in the course of their lives. It is not hyperbolic to suggest that this is nothing short

of a psychological survival skill in this information-saturated and media-dominated era.

Of course not all examples of the paranormal and the pseudosciences have been discussed, nor all resources available listed. (For example, past articles in this journal have rarely been cited—but readers of the SKEPTICAL INQUIRER are well aware of the content of past issues.) But we have touched on at least some of the new nonsense most popular with our children, and all the resources mentioned have been chosen using the criteria of readability, accessibility, and potential for impact upon young minds. If teachers and parents actively begin to utilize these resources and methods, surely recruits for the ranks of gullible believers needed by the next generation of high priests of the pseudosciences will become more difficult to find.

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Book Reviews

The Psychology of the Psychic. By David Marks and Richard Kammann. Prometheus Books, Buffalo, N.Y., 1980. 232 pp. $16.95 ($7.95 paper).

Reviewed by Ray Hyman

Marks and Kammann, both psychologists at the University of Otago in New Zealand, have written a "debunking" book. In particular, they debunk the claims of psychic powers involved in the stage feats of the magician-mentalist Kreskin, the mind-reading and metal-bending exploits of the alleged psychic Uri Geller, and the supposed correspondences between target and description in the remote-viewing experiments of Targ and Puthoff. In each of these cases the authors not only critically examine the original claims, but also engagingly describe their own personal investigations of the alleged phenomena. They witnessed several of Kreskin's stage performances and eventually figured out how he achieves his seeming miracles. They not only witnessed several of Geller's stage demonstrations, but they also interacted with him personally on several occasions. Probably the most interesting and educational portions of the book deal with how they gradually came to suspect trickery on Uri's part and then, in the best tradition of detective stories, gradually unraveled, trick-by-trick, how Uri accomplishes each of his effects.

The reader of *The Psychology of the Psychic* should have little trouble following the step-by-step exposé of both Kreskin and Geller. The critique of the remote-viewing experiments, as well as of the ambitious experiment conducted by Alistair Hardy, involves technical matters having to do with statistics, experimental design, and the logic of scientific inference. Here I suspect the untrained reader will encounter difficulties. The authors, however, make a valiant attempt to present their arguments in as nontechnical a fashion as possible.

Although the readership for debunking books is minuscule in comparison with the market for mystery-mongering publications, the actual number of such books is now quite large and still growing. Many of these debunking books unfortunately are as ill informed and as sensationalistically oriented as the ones that they are attacking. They do more harm than good in that they tend to confirm

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the claim of psychic believers that the critics are dogmatists, use false arguments, misrepresent the evidence, and do not respond to the actual propositions put forth.

Marks and Kammann join the very small number of debunking books that deal with the actual claims and evidence put forth by proponents of the paranormal. They carefully dissect the claims and show why they are not justified. But the merit and unique contribution of this book is that it goes beyond responsible criticism. Marks and Kammann try to employ current psychological findings to explain how individuals come to believe something that is not so.

The book is quite useful in naming and illustrating a number of cognitive biases that induce fallacious belief. A partial listing would be: subjective validation, data selection, population stereotypes, demand characteristics, the fishing fallacy, the principle of equivalent odd-matches, the clustering illusion, the gremlin illusion, Koestler's fallacy, the fallacy of personal validation, and illusory correlation.

This book was quite successful in sensitizing the students in my course "Pseudopsychologies" to such fallacies. I assigned *The Psychology of the Psychic* as one of the four required readings (the other three being Jahoda's *The Psychology of Superstition,* Giere's *Understanding Scientific Reasoning,* and Vogt and Hyman's *Water Witching U.S.A.*). Both in their term papers and on the final examination the students had to demonstrate that they could critically evaluate various pseudopsychological claims. I was quite pleased with the results. And it was evident that much of the students' success in dealing with paranormal claims was due to having read and absorbed the concepts and tools in *The Psychology of the Psychic.*

The book succeeds very well not only in pointing out the fallacies in certain claims of the paranormal but also in teaching the reader tools for detecting such fallacies in other claims. Moreover, Marks and Kammann, as I have already indicated, go beyond the usual debunking book by not only demonstrating that the claims are unjustified but also supplying plausible psychological reasons for proponents believing in them. In addition, it is written from a personal perspective and captures the interest of the reader.

But I do have questions and quibbles. The authors quite rightly focus on three cases with which they have had personal involvement. But they wrongly, in my opinion, imply that these three cases typify current parapsychological research. And they further imply that the very same weaknesses and fallacies they attribute to their three illustrations suffice to debunk all parapsychological claims. A perusal of several of the chapters in the recent *Handbook of Parapsychology* quickly reveals that much of the experimental evidence for ESP and PK cannot be so easily faulted as are the claims for remote viewing and Uri Geller's accomplishments. The work on random number generators initiated by Schmidt and the Ganzfeld experiments of Honorton and others do not obviously reveal the sort of flaws that Marks and Kammann point out in the studies they debunk.

My point is *not* that these studies are beyond criticism. Rather, I want to make it clear that the investigations of Geller and remote viewing do not represent the best of current parapsychological work. Much of the current work requires criticism that is more sophisticated and subtle than what was needed to demolish the cases discussed by Marks and Kammann. The readers, not having been forewarned, might mistakenly believe that the tools and critiques supplied by the authors will be sufficient to dismiss all parapsychological claims. When they are confronted with some of the better parapsychological research, they might be stymied and ill prepared. Worse, they might become persuaded that Marks and

Kammann have misled them.

Some different sorts of questions might be raised by the role of Kreskin in this book. The authors do indicate that the discussion of this entertainer is "a relaxing interlude." And they indicate that his case is included because many individuals believe that Kreskin's stage tricks are actually produced by psychic powers. It would have been fairer to parapsychologists, however, to point out that they do not believe Kreskin is psychic, nor is it likely that he could convince them that he is.

Another group who will certainly be upset with the inclusion of Kreskin are those professional magicians known as "mentalists" (of whom Kreskin is clearly one). Like other magicians, the mentalists want to protect their secrets. If the public knows how they accomplish their pseudo-mindreading stunts, then there is no mystery and no interest. Mentalists were even upset when fellow magician Randi began his crusade to expose Uri Geller as a trickster. Many mentalists considered Uri to be one of them. They viewed his success as a boon to mentalism. I have already heard from some mentalists who are very upset because Marks and Kammann have gone out of their way to expose the tricks that Kreskin employs to create the illusion that he "reads" minds.

However, Kreskin brought this situation upon himself. As Marks and Kammann make clear, Kreskin is a master of sleight-of-tongue who simultaneously manages to deny he is psychic while strongly implying, and even sometimes claiming, the possession of paranormal powers. This reveals an unfortunate ethical dilemma in this form of magic. Conjurors, by common agreement, are not supposed to delude the public into believing in truly paranormal forces behind their effects. Like actors, stage magicians are playing a role for entertainment purposes. The audiences are fooled, but they are satisfied that natural laws have not been violated. They are willing to accept the demonstrations under the vague belief that somehow it was all done with mirrors or that the hand is quicker than the eye.

Mentalists, however, entertain not just because they gain information in ways that fool the spectators but because the spectators *want* to believe that ESP may actually account for what they are witnessing. And the mentalist usually obeys the letter of the law by carefully avoiding outright claims to psychic powers. But the mentalist knows that his continued success depends upon the extent to which audiences actually believe they are witnessing true ESP and PK. So Kreskin, as well as other mentalists, do all they can to imply and suggest, without overtly claiming, paranormal powers.

And it is such a dilemma that puts the successful mentalist on a collison course with both the serious parapsychologist and the scientific skeptic. In the case of Marks and Kammann, we have two scientific psychologists who were genuinely concerned about current claims of the paranormal. Neither of these men have any background in conjuring. So they were puzzled when they first witnessed Kreskin's stage performance. They seriously entertained the possibility that he was employing true psychic powers. This encouraged them to take a second look and compare notes. They then noticed some inconsistencies in what Kreskin did and said. They canvassed spectators. Eventually they put two and two together and figured out how Kreskin accomplished through trickery each of his effects. And since these psychologists are not bound by any magician's code, they have no scruples about exposing these effects. Indeed, from their viewpoint, they feel they *have* to expose the methods in order to make it clear that we can falsely believe something is paranormal when it is perfectly natural.

But these quibbles aside, the book is an entertaining and useful contribution to our knowledge about how powerful psychological forces can operate to create the compelling conviction that psychic forces are real. ●

The Psychic Experiment Book. By William Jon Watkins. Prentice-Hall, Englewood Cliffs, N.J., 1980. 283 pp. Paper

Reviewed by James Randi

The author of *The Psychic Experiment Book*, we are told, has taught a college-level course in parapsychology for three years. And he has been experimenting in the manner described here for fifteen years. I trust that the other eight books he is credited with have demonstrated a better grasp of his subject.

The book is "devoted . . . to simple experiments anyone can perform to determine for themselves if the reported phenomena have any validity." True, in some cases the tests are quite able to show the truth behind the claims investigated. In these, Watkins is careful to tell the reader, "Do not be discouraged if only negative results are achieved." Wise advice.

Scattered throughout the sensible comments and observations on experiments suggested for meditation, auras, psychic healing, biorhythms, ESP, dowsing, pyramid energy, and numerology, we find some giveaway schoolboy howlers: Wilhelm Reich was "put in jail for his ideas"; electromagnetic energy will not pass through insulators; the process of ancient Egyptian mummification is not understood by modern science; and the Heisenberg Principle is dragged in to support paraphysics, as usual.

The section on biorhythms demonstrates Watkins's basic inability to design an experiment. He proposes, to test whether injuries are apt to occur to an athlete on "critical" days: (1) Record dates of injuries to an athlete. (2) Calculate the biorhythm curves for that person. (3) Note if an injury occurred on *any* critical day (not just the physical curve, but all three).

A much better method, though one that tends not to give the desired positive result, is: (1) Calculate the curves. (2) Determine, by the rules of this "science," points on the curves where injuries are *supposed* to occur. (3) Check the record of injuries to see how many occurred and did *not* occur on the appropriate "critical" day. (4) Score +1 for each correlation, -1 for each miss. And thus re-discover the law of averages.

Even his system for calculating the curves is sloppy. One should be careful, when determining useless data, to do so with great care. Thus the data will be *perfectly* useless.

I noted with amusement, in his "sight" tests, that he has described with considerable accuracy *exactly* the equipment and procedure used by professional conjurors to do the blindfold trick—and he suggests that method for blocking sight! Two simple ovals cut from adhesive tape would do the job excellently, rather

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James Randi is a magician and psychic-claims investigator.

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than the involved procedure he recommends. One test verifies the existence of the "blind spot" on the human retina, though what that has to do with things psychic, I cannot guess. It is refreshing, however, to see one real experiment in the book.

Under "Psychic Healing Experiments" we are told to cure a headache through some fancy mental gymnastics, no time span given, and no controls. If it persists, he says, repeat the procedure. Eventually, we are told, it should go away. Brilliant.

To heal a friend or relative and determine experimentally if it has worked, he tells the student to have the attending doctor make a list of stages he expects the patient to go through in recovery, and the amount of time it should take for each stage. (It is not difficult, knowing the medical profession, to see that the rare physician who would do such a thing would also allow much time for each stage.) Naturally the patient, questioned and prodded by the "healer," tends to arrive at each stage rather sooner than is really the case, but Watkins seems to think that we get around this "experimenter expectation" effect by sealing away, unseen, the part of the doctor's statement giving the estimated time-spans: thus we cannot know whether the healer is speeding up the process or not. And there are no provisions made for patients who die. I suspect that such an experiment would not be reported, and the results ascribed to an uncooperative subject.

Experiment M-6 is a doozy. We are given a selection of mantras to choose from. The numbers from one to nine constitute a "scientific" mantra. Next is the old standby, "Om." And for those of us who see the devil in such shenanigans, he offers Buddhist, Moslem, and Christian versions—the latter being "Hallelujah!"

Though we are told, in the introduction, that, "hints for protecting each experiment from self-fulfilling prophecies will be given throughout" (I presume he refers to "experimenter expectation") this is seldom done. There are numerous tests described that allow the experimenter to read into the results just what he wants to see there. Precautions against that possibility would doom such experiments to failure.

A chapter on testing for human "auras" fails every test of logic, experimental design, and common sense. Watkins suggests the use of dicyanin filters. True, an "aura" effect can be observed with these filters (which the author erroneously claims can enable the viewer to "see in the ultaviolet region"), but what can be seen around the human body can also be seen around a simple cardboard cutout. But such a comparison would cut a seven-page chapter to a simple half-page.

The last chapter is titled "Reality" and has nothing whatsoever to do with it. Describing the mysterious fact of reflection in mirrors, Watkins tells us quite plainly that "mirrors are also points of passage between universes." So much for his grasp of reality.

Throughout this book, any high-school student could pick out basic scientific errors and great loopholes in experimental procedure. There are few precautions—in using a simple galvanometer, Watkins fails to ask the student to avoid bringing any magnetic materials near the device while looking for effects on that instrument; a simple piece of iron passing by it would send it off scale. While a cursory reading shows apparent doubt of many claims represented here, the bibliography exhibits *not one* negative-opinion book in the 33 listed, some of which are legitimate science books from which he tells us we may derive some hints on further possible psi tests. Thus the other silly books gain respectability by being listed alongside real science.

To show the kind of work that passes for science among the amateurs, this book is useful. At that point its value ends. •

The Gemini Syndrome. By R. B. Culver and P. A. Ianna. Pachart Publishing House (P.O. Box 35549, Tucson, AZ 85740), 1980. 215 pp. $11.95.

Reviewed by Bart J. Bok

The Gemini Syndrome is quite a remarkable book. Two young and competent astronomers have taken out time from their teaching and research to inquire about the origins and practices of astrology and astrologers. And they have written a book about it all. It is a scholarly volume, but anyone with a high-school education who tries hard can follow their arguments and see what nonsense it really is for so many (28 percent of all Americans, according to a Gallup poll) to have at least a modicum of faith in the predictions of astrology.

Since the late 1930s, I have been active in arguing against astrology. I had off and on thought of writing a book on the subject, but I never got around to it because my real interest in life was to study the nature of our Milky Way system, which is a vast field of research. I have contented myself instead with taking out a month or two every ten years or so to write an article condemning astrology, hoping that young people, especially those who had become intrigued with astrology, would read my story and learn from it that scientifically trained astronomers have no use for astrology. Many of my colleagues in astronomy criticized me from time to time for paying attention to astrology, which—so they said—was below the dignity of professional astronomers to recognize as an existing, cheap fad. I am grateful to the two young authors of the present book for having had the courage to swim against the current.

The book opens with a clear and concise statement about the basic philosophy and practice of the scientific method, which is never applied in full in the arguments presented by astrologers. Next, Culver and Ianna devote a chapter to describing how the "professional" astrologer prepares his horoscopes, stressing that no such horoscopes are complete without taking into account the precise place of birth of the subject and the date *and time* of birth. They then explain the tortuous abacadabra that the astrologers use to interpret these horoscopes. By the way, the drawing of a good horoscope is not a difficult technical achievement. I have done several in my lifetime and published one of them. The authors present a detailed horoscope drawing in their book. The victim was apparently born at Brigham City, Utah, on September 6, 1940, at 9:20 P.M.; nice work!

In the second chapter, we find a comprehensive survey of the history of astrology, which began in ancient Babylonia about 5,000 years ago. A most important summarizing text, *Tetrabiblos,* was published by Claudius Ptolemy in A.D. 140. It is still the bible of astrologers today. Ptolemy wrote a second volume, one entitled *Almagest,* in which the knowledge of astronomy of the day was summarized. That volume is accepted as the best statement for the time when it was published, but so much has happened in astronomy since the days of Ptolemy that we would not think of using it at the present time. But astrologers still use *Tetrabiblos* as their basic text; the needle got stuck early in the game.

Bart J. Bok is professor emeritus of astronomy, University of Arizona, and past president of the American Astronomical Society.

The authors go into some detail about the attitudes toward astrology in the days of Copernicus, Kepler, and Newton. They quote with relish Kepler's "Astrology is the foolish stepdaughter of astronomy."

We are all acquainted with the spread of astrology in the United States and Europe, where the newsstands have dozens of astrological magazines, the newspapers print daily columns with worthless advice because their readers want these columns every day of the week, and radio and TV spread the false gospel. I was in India in February 1980 to view the total eclipse of the sun. I understand that at the time of the eclipse the streets of Bombay and of Delhi were deserted, that the buses stopped running for a couple of hours, and that the women were advised to stay indoors to protect themselves from the bad rays of the eclipsed sun. We still have a long way to go before, collectively, we can rid ourselves of false and totally unjustified superstitions.

There follows a nicely written chapter on the universe in which the sun and earth find themselves, and next we read two well-written chapters on the practices of interpreting horoscopes and a critical analysis of these practices. The authors deserve our thanks and congratulations for the scholarly way in which they treat these subjects. With all its references, the book will prove invaluable for all who in the future want to examine the tenets of astrology.

There is a fine chapter about the minuteness of the gravitational and tidal forces and also the electromagnetic radiation effects that are sometimes called upon to explain astrological "forces" in terms of today's physics. There is a devastating chapter on the nonsense of sun-signs and their use in the preparation of the daily astrological advice printed in the newspapers. If the astrologers lived by their own rules, they would refuse to prepare the texts for these daily columns. The newspapers should be ashamed to publish them.

The book ends with a series of tests, which the authors present in an attempt to get the astrologers to prove the validity of their work. There are ten of these, the first one being: "Given the times, dates and places of birth of sixty individuals, half of whom are violent criminals and the other half peaceful, law-abiding citizens, identify at least 27 of the 30 criminals."

Why do people believe in astrology? First of all, because we all have a knack for remembering whenever success follows a prediction, while we naturally forget and overlook the times of failure of a prediction. Second, because it is so comfortable and helpful for many of us to have available constant advice about what to do and what not to do.

We must all learn, especially the young, that decision-making is one of our most basic assignments in life. Astrology destroys our will to do so.

I am very glad to have had a chance to review this book, which will have a permanent spot in my bookshelves. Thank you, Roger Culver. Thank you, Philip Ianna. ●

Some Recent Books

Listing here does not preclude a more detailed review in a future issue.

de Mille, Richard, ed. *The Don Juan Papers: Further Castaneda Controversies.* Ross-Erikson, Publishers, 629 State St., Santa Barbara, Calif. 93101, 1980, 518 pp., paper, $8.95. Further inquiries and follow-ups regarding Carlos Castaneda's fabulous hoax and the academic community's passive complicity in it. Editor de Mille, author of *Castaneda's Journey,* the original exposé, here assembles 39 original essays that provide insights into the fallibilities of human judgment, the unsimplicity of truth, the different perceptions of skeptics and proponents, and the complacency of the ivory tower. Anchored by de Mille's own essays and commentaries, always a pleasing mixture of erudition and wit.

Hanen, Marsha P., Margaret J. Osler, and Robert G. Weyant, eds. *Science, Pseudo-Science and Society.* Wilfrid Laurier University Press, 75 University Ave., West, Waterloo, Ontario, 1980, 303 pp., paper, $7.50. Twelve historians, philosophers, and psychologists examine historical roots, impacts, and social dimensions of pseudoscience. Proceedings of a 1979 conference sponsored by the Calgary Institute for the Humanities.

Randi, James. *Flim-Flam: The Truth About Unicorns, Parapsychology and Other Delusions,* New York: Lippincott & Crowell, 1980, 340 pp., $12.95. Randi's long-awaited and lively investigative excursion through the SRI experiments, medical humbuggery, levitation claimants, metal-benders, table-tippers, dowsers, and assorted other examples of flummery and self-deception. His outspokenness may offend some, but his willingness and ability to ferret out sham and nonsense is virtually unparalleled.

—*K.F.*

Articles of Note

Bainbridge, William Sims, and Rodney Stark. "Scientology: To Be Perfectly Clear." *Sociological Analysis* 41 (2) (1980): 128-136. Outlines a theory of how the cult of Scientology can sustain faith in its claimed ability to raise members up to a superhuman level of mental functioning known as "clear" despite an absence of demonstrable success in doing so.

Bova, Ben. "The Creationists' 'Equal Time.'" *Omni,* October 1980, p. 35. Strong statement about dangers of this latest political movement.

Gorman, James. "Creationism on the Rise." *Discover,* vol. 1, no. 1, October 1980. Report on the new anti-evolution movement.

Hinckle, Warren. "Ronald Reagan's Affinity for Stargazers." *San Francisco Chronicle,* July 19, 1980. Report on Reagan's long flirtation with astrology. Author contacted Jeane Dixon. who summarized their relationship: "I'm not considered one of his advisers—but I advise him." A sidebar article describes Reagan aides' denunciation of syndicated astrologer Joyce Jillson's claim that

she had been paid $1,200 by the Reagan campaign to do horoscopes on eight prospective Reagan vice-presidential prospects.

Holden, Constance. "Republican Candidate Picks Fight with Darwin." *Science*, September 12, 1980, p. 1214. Report on Reagan's avowed sympathy with creationists.

Karnes, Edward W., Ellen P. Susman, Patricia Klusman, and Laurie Turcotte. "Failures to Replicate Remote-Viewing Using Psychic Subjects." *Zetetic Scholar*, July 1980, pp. 66-76. Psychologists report on their attempt to replicate independently the remote-viewing experiment results of Targ and Puthoff, using eight self-proclaimed psychics. The results "offered no support for the existence of a remote-viewing paranormal perceptual capability in a group of experienced psychic subjects."

Lenington, Sandra. "Effect of Holy Water on the Growth of Radish Plants." *Psychological Reports* 45 (1979) : 45. No effect was found.

McKusick, Marshall. "Prehistoric Vermont and the Antiquarian Revolt." *Vermont History* (Vermont State Historical Society), Summer 1980, pp. 183-187. Discussion of rebirth of romantic myths seeking pre-Columbian Europeans in America.

McKusick, Marshall, and Eugene A. Shinn. "Bahamian Atlantis Reconsidered." *Nature* 287 (1980): 11-12. Reexamination of amateur enthusiasts' claims of "submerged ancient roadways" off the island of Bimini finds the tabular blocks to be rapidly formed natural limestone called beachrock. Comments also on social and religious (Edgar Cayce cult) motivations for persistence of the Bimini-as-Atlantis myth.

Moss, Samuel, and Donald C. Butler. "The Scientific Credibility of ESP." *Perceptual and Motor Skills* 46 (1978): 1063-79. Critique finds that the skepticism of academic psychologists toward ESP is well based and arises because the evidence for ESP has failed to meet generally accepted scientific standards on at least five counts.

Oberg, James. "Minnesota Attack." *Omni*, October 1980, p. 30. "UFO Update" column discusses the August 27, 1979, Warren, Minn., police-car damage case.

Rice, Berkeley. "Mind Bending at Berkeley." *Psychology Today*, October 1980, pp. 8-12. Detailed report of behind-the-scenes events leading up to decision to grant the first Ph.D. degree in parapsychology by any American university (see News and Comment, p. 10 of this issue).

Russell, Dan, and Warren H. Jones. "When Superstition Fails: Reactions to Disconfirmation of Paranormal Beliefs." *Personality and Social Psychology Bulletin*, March 1980, pp. 83-88. Study of effects on believers and skeptics when evidence on paranormal claims disputes their beliefs. Finds that believers tend to recall poorly or distort the evidence when it counters their beliefs; skeptics tend to recall unsupportive information correctly. Suggests that paranormal beliefs persist among believers because contradictory evidence arouses such dissonance that it prevents the learning of the information.

"Skeptical Eye." *Discover*, vol. 1, no. 1, October 1980. Department in first issue of Time, Inc.'s new science magazine reports on Bigfoot claims in the Midwest and *The Roswell Incident*, Charles Berlitz's latest exercise in unfettered speculation.

Stark, Rodney, and William Sims Bainbridge. "Networks of Faith: Interpersonal Bonds and Recruitment to Cults and Sects." *American Journal of Sociology*

85 (6) (1980): 1376-95. Finds that social networks—not just ideological agreement—play an essential role in recruitment both to cults and sects and to conventional faiths. Social networks do not seem to play an important role in acceptance of mildly deviant occult ideas such as belief in ESP, Tarot cards, seances, psychic healing, and astrology, which are spread mostly through the mass media.

Truzzi, Marcello. "A Skeptical Look at Paul Kurtz's Analysis of the Scientific Status of Parapsychology." *Journal of Parapsychology*, March 1980, pp. 35-51. Lengthy critique of the article "Is Parapsychology a Science?" which appeared in the Winter 1978 SKEPTICAL INQUIRER.

Wade, Nicholas. "Does Man Alone Have Language? Apes Reply in Riddles, and a Horse Says Neigh." *Science*, June 20, 1980, pp. 1349-51. Report on the New York Academy of Sciences symposium on the Clever Hans phenomenon—indeed, on unconscious deception in all its varieties, especially as applied to ape language research.

—*K.F.*

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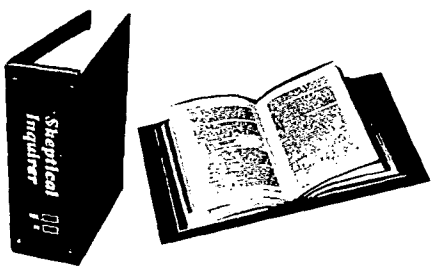

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From Our Readers

The letters column is a forum for views on matters raised in previous issues. Letters are welcome and are more likely to be published if they are typed and double-spaced. Some may have to be edited.

Attitudes toward paranormal claims

The exchange of correspondence between Chamberlin and Randi (*SI*, Summer 1980) brings out very clearly perhaps the chief difficulty confronting the work in which CSICOP and the SKEPTICAL INQUIRER are engaged. Chamberlin, I believe quite rightly, criticizes Randi's experiment as not being a well-designed test of the possibility of dowsing. Randi, again I believe quite rightly, defends the work as a valid test of the claims of individuals who professed to have dowsing abilities. Disagreements such as those between Chamberlin and Randi will persist until both sides acknowledge that they are really talking about two quite different things.

The matter is of interest beyond the present exchange of correspondence, because it reflects, I am sure, attitudes to be found among two large portions of the readership of your journal. One group consists of those, like Chamberlin, who wish to see fringe subjects discussed sensibly, with regard to the rules of evidence and reproducibility and common sense, and who are prepared to entertain the possibility that some of these fringe subjects may have a few kernels of wheat hiding among the chaff; they would like the Committee and the journal to be engaged in seeking those kernels. Randi, on the other hand, belongs to a group that is sick and tired of ridiculous claims made without regard to evidence or reason on an apparently limitless number of fringe topics and is concerned primarily with demonstrating how hollow are the claims of the fanatics. To my mind, the difference of opinion that led to the resignation of Marcello Truzzi was on the same point: Paul Kurtz putting first the task of exposing invalid claims, Truzzi being concerned as much for the discovery of the possible kernels. Those two attitudes are not, of course, mutually exclusive; Chamberlin and Randi, and Kurtz and Truzzi, I am sure, share some of each—just to differing extents on a particular topic. But to satisfy the interests of the two groups requires the ultimate in judgment and diplomacy in the editorial policy and practice of the journal.

These different aims can be pursued amicably and jointly through the journal only if we are all prepared to examine our presuppositions in the most rigorous possible way and to agree to differ when an argument turns out to involve differing preconceptions rather than substantive differences about

facts. The seekers of the precious kernels must be prepared to acknowledge that, on occasion at least, they are looking for truths in the absence of evidence that any exists; the debunkers must guard against claiming too much, a natural tendency spurred by the fear that charlatans and frauds might derive comfort from some kernel of truth that they can claim as their own even though it may be essentially irrelevant to their actual theses. As an example of the latter, many critics of Velikovsky went beyond the evidence and the existing theory in attempting to discredit him, instead of concentrating on the valid point that his advance claims were cast in such indefinite terms that they could be neither proved nor disproved by any accumulation of data.

It is my interpretation that the primacy of the aim of debunking, with the corollary that anything in the way of debunking is good, also led to the writing (*SI*, Spring 1980) of an overly enthusiastic review of the book *Exploring the Unknown*. So favorable was the review that I obtained the book at once; and I was largely disappointed. The brevity of treatment of many of the topics gave the discussion a somewhat dogmatic, assertive tone—which would not trouble one who already has applied sense in thinking about these subjects but might not best serve the interest of educating others. My chief complaint is that the tone is one of "writing down" to the reader, portraying scientific activity in terms of the most simplistic norms—"scientists hate to be dogmatic"—which have long been discarded by the historians, philosophers, and sociologists of science as any valid representation of what scientific activity actually is, as opposed to what we might like it to be in some ideal world. Let me hasten to add that the book has some very great virtues which were pointed out: the general discussion of fallacies in pseudoscientific works, for example; and the discussion of Velikovsky is one of the very best that I have seen. But I fear that the overenthusiastic review might indicate a belief that the way has been found to combat scientific illiteracy and pseudoscience. In my view, the book is merely a start, with some deficiencies that we need to recognize clearly in order to do better.

Henry H. Bauer, Dean
College of Arts and Science
Virginia Polytechnic Inst. and State Univ.
Blacksburg, Va.

Disappointed reader

I am afraid that unless the magazine improves radically, I will have to let my subscription lapse, after two years of membership.

What's wrong? First, the same old tired articles. Every rational person knows UFOs, special creation of "man," and Uri Geller are nonsense. Second, the same old tired authors: Kurtz, Klass, Randi, etc. I know of others who have submitted letters and manuscripts and none have appeared. In short the magazine rather than fulfilling its purpose, to scientifically investigate claims of the paranormal, has become an "in-groupy" outlet, an erudite and closed preserve.

Sorry to see all this happen. I hope the SKEPTICAL INQUIRER shapes up.

Kurt Haas
Psychologist
New Paltz, N.Y.

True liberality

I want to make a brief comment and ask a question. First the comment. I very much appreciate the SKEPTICAL INQUIRER. It is a welcome breath of fresh air and clear thinking in a world often muddled in its ability to distinguish fact from fiction. I have noted a great confusion between liberality and standardlessness, particularly here in California. To me the CSICOP represents true liberality (in the sense of open-

mindedness to new ideas) coupled with very high standards. No idea is too outrageous for investigation, but no weird idea is accepted on the grounds of hearsay or sloppy evidence.

Now the question. You sometimes include one's title in the address. Mine was listed "Dr." and may now be "Lt." It could just as well be "Rev." since I am a Presbyterian minister. I wondered if any other ministers, priests, or rabbis subscribed to the SKEPTICAL INQUIRER. I would assume that there weren't many of us, but who knows?

William R. Clough
U.S.S. Ogden
FPO San Francisco, Calif.

Ambitious goal

I just received the Summer 1980 SKEPTICAL INQUIRER, and as usual it was *splendid.* The work you and the contributors to the publication are doing seems to me to be of the utmost importance.

I was pleased to note some new names, like Armando Simon and John Kenny in this issue. The article by William Sims Bainbridge and Rodney Stark was most interesting, although it was a bit unpleasant to note that *Fate* magazine has more than 100,000 subscribers.

When Philip Klass told me that the SKEPTICAL INQUIRER had a circulation of approximately 6,000 I thought that it was low, but the figure for *Fate* indicates how low it really is. I would think, considering the quality of the *SI* and the broad range of topics covered, that it is destined to become much larger in circulation. Perhaps as an intermediate objective you should try to equal *Fate,* but I feel certain that a million subscribers is obtainable. That is, after all, less than 0.5 percent of the population of the United States alone.

Michael R. Dennett
Vienna, Va.

Fundamentalists and cults

Bainbridge and Stark's "Superstitions: Old and New" (*SI,* Summer 1980), surely tends to confirm a widely held view in academia that sociology is a rather undisciplined discipline, nascently thrashing about in search of something—anything—to "document," and that sociologists possess a special talent for magnifying the mundane while obfuscating the obvious.

Examples of conceptual sloppiness, blatant ambiguity, insufficient distinctions, and miscategorization run rampant through the entire piece. For example:

1. "Occultism" is used equivocally, at one time meaning "approval of or allegiance to cults" and at others "belief in the occult—witchcraft, demonology, etc."

2. No definition of a "cult" is given, nor have I ever seen any set of defining characteristics that could distinguish a cult from any of the conventional, mainstream religions.

3. Respondents were asked whether things "had value" or whether they "liked or disliked" certain things—hopelessly fuzzy queries, since the critical issue is the *why* of a dislike. Clearly, there is all the difference in the world between (a) individuals who dislike chocolate ice-cream because it doesn't taste good, (b) those who dislike it because it is too fattening, (c) those who dislike it because it is dirtier than vanilla, and (d) those who dislike it because it is like the color of negroes. These, and numerous other inaccuracies, enable them to draw "interesting" conclusions, such as that "born agains are much less likely than others to accept radical cults and pseudoscientific beliefs." Thus this startling conclusion turns out to be as "interesting" as the news that Jews are not very likely to be Amish!

Religious fundamentalists are members of a closed, rigid dogmatism that itself decides, on its own murky grounds, which entities are real and which experiences are veridical. Our

sociologists' assessment that the fundamentalists "appear most virtuous according to scientific standards" and that "we ought to praise them for their responses [on the occult]" is nothing short of ludicrous. On the same grounds, we ought to praise the man who claims that there are no unicorns in the forest, even if he attributes the unicorns' absence to their having been driven out by leprechauns!

Fundamentalists reject occultism; not for the reason that there are no such things as occult entities, but because they believe occultism to be the work of the devil, the Antichrist, the Beast, or whatever other assorted beings they keep penned up in their mental, medieval menageries.

I find the article to be a splendid case of padding out, patching up, and camouflaging the fallacy of the undistributed middle. Fundamentalists oppose occultism; we (the CSICOP) oppose occultism; therefore, we should applaud fundamentalists. C'mon fellows; have you heard of logic?

Tony Pasquarello
Professor of Philosophy
The Ohio State University
Mansfield, O.

Bainbridge and Stark seem to be of the opinion that religious fundamentalism is a safeguard against pseudoscientific beliefs. The central point, in my opinion, is not whether fundamentalists are more or less likely than those without religion to embrace a belief in flying saucers, etc., but whether religious fundamentalism is a pseudoscience every bit as pernicious as the flying saucer cults, dowsers, etc.

The statistics collected in the 1979 survey of Washington undergraduates tell us that 67 percent of those with no religion and 43 percent of born-again Christians believe that UFOs are probably spaceships from other worlds. Stark and Bainbridge seem to conclude from this that those people with no religion are more likely to embrace pseudoscientific notions than are fundamentalists. I cannot agree with this.

Of the 33 percent with no religion and the 57 percent of fundamentalists who do not believe in UFOs, how many believe the earth was created around 4000 B.C. It is apparent that fundamentalists are much more prey to this notion than are those with no religion. Is this belief not directly opposed to science?

In the study comparing the number of cults in geographic regions with the degree of church membership, the Bainbridge-Stark study shows a higher number of cults per million residents in regions of low church membership than in regions of high church membership (6.6 cults per million residents in the Pacific Coast region, as compared to 0.9 in the West South Central region). However, if fundamentalism itself is considered a cult, the number of cults in the West South Central region (the area showing the highest percentage of church membership) would undoubtedly rise much more than that of the Pacific Coast region (which has the lowest percentage of church membership).

The only thing that the Bainbridge and Stark study can tell us is that people immersed in one cult are less likely to become involved in a particular cult, if it contradicts tenets of the first, than are those with no such primary cult association. I am sure that committed Scientologists are much less likely to fall prey to the Moonies' philosophy than are those with no religion. It does not follow that Scientology should be praised for checking the spread of pseudoscience.

Maryann Roth
Lebanon, Pa.

Bainbridge and Stark conclude that lack of religious affiliation predisposes one to "accept the new superstitions," but this is not supported by the evidence they present. Let us take a look at the seven questionnaire items in their Table 3 (p. 24).

On two items, the people with "no religion" are *less* favorable to the occult than either group of "ordinary Christians," Catholics or Protestants. On two items, the unbelievers fall in the midst of Christians, less favorable than the Catholics and more favorable than the ordinary Protestants. On two items, the unbelievers are more favorable than either Catholics or Protestants, but by an insignificant amount. Finally, one item shows the unbelievers significantly—by 7 and 13 percent—more favorable to the "occult" than either group of ordinary Christians. The item reads: "Some Eastern practices, such as Yoga, Zen, and Transcendental Meditation, are probably of great value." (Judo?) Furthermore, most people think of Yoga and TM in purely materialistic terms, not as "oriental cults."

In conclusion, Bainbridge and Stark's results show that "born again" Christians are resistant to (dare I say "other") occult beliefs but that ordinary Christians and unbelievers are about the same. However, the pattern of data leads me to suspect that the unbelievers are more polarized, both more hostile *and* more favorable to the occult and paranormal. Let me hypothesize: those who reject religion for emotional reasons will likely replace it with occult beliefs; those who reject religion on the grounds of reason will not.

Taras Wolansky
Thiells, N.Y.

Williams Sims Bainbridge and Rodney Stark reply:

We fully agree that our brief article, "Superstitions: Old and New," has not proved *its main thesis that old superstitions defend against new superstitions and that a society entirely without superstition cannot be achieved. As several readers have pointed out, there are gaps in our theory, in our data, and in our interpretations of how the two fit together. This is always the case in science. No one study* proves *anything. Rather, each good study gives support to one theory or another, and a series of good studies can demonstrate that the preponderance of evidence is on one side of an argument rather than the other. For a deeper statement of theory and more complete data, we must refer readers to our other recent publications.*

Initial stages in our deductive theory of religion, including definitions of several basic terms, can be found in the June 1979 and June 1980 issues of Journal for the Scientific Study of Religion. *At present we are completing a rather technical theoretical book expanding on this material. More specific theoretical statements about cults can be found in "Cult Formation: Three Compatible Models" and "Scientology: To Be Perfectly Clear" in the Winter 1979 and Summer 1980 issues of* Sociological Analysis. *"Sectarian Tension," to appear in* Review of Religious Research, *will examine the nature of religious sects, and some commonalities between sects and cults are explored in our article in the May 1980 issue of* American Journal of Sociology. *Our earliest statements of cult theory are in "Becoming a World-Saver" by Lofland and Stark* (American Sociological Review, *1965), in* Religion and Society in Tension *by Glock and Stark, and in my own recent book,* Satan's Power: Ethnography of a Deviant Psychotherapy Cult.

One strength of "Superstitions: Old and New" is that it employs two very different kinds of data, a survey and a geographic analysis. More results from the student questionnaire will be reported in "The 'Consciousness Reformation' Reconsidered" (Journal for the Scientific Study of Religion, *in press) and "Friendship, Religion, and the Occult"* (Review of Religious Research, *in press). More geographical results can be found in "Cults of America: A Reconnaissance in Space and Time"* (Sociological Analysis, *Winter, 1979) and "Client and Audience Cults in America"* (Sociological

Analysis, *in press). Further, readers might look for two other articles, "The Rise and Decline of Transcendental Meditation" and "Secularization, Revival, and Cult Formation," which are to appear.*

We are pleased that our research stimulates such interest. Only through reasoned, empirical, public, scientific debate can we learn for sure if our society will ever escape superstition, or if at best it can only select the particular kind of superstition it will suffer.

The Velikovsky ad

Your offer to publish a response from Doubleday to your article concerning our ad for Dr. Velikovsky's works (*SI*, Fall 1980) is most gracious. However, I think the scientific evidence that has supported Dr. Velikovsky's work since he first presented his theories speaks for itself. Thank you very much for your time and your consideration.

Hugh O'Neill, Editor
Doubleday & Co.
New York, N.Y.

Our heroes

Recently I saw on a TV program an unnamed man preparing for some unspecified stunt over Niagara Falls in winter. It was obviously bitter cold. Much of the falls was frozen. This man, bundled against the weather and wearing a ski mask, was bound in a strait jacket and god knows what else, then suspended by his feet from a helicopter that proceeded to hover over the center of the falls. I did not want to see him fall to his death—I worried for his safety—why would they show such a tragic thing? Then he was shown, with some struggling, to shed his bonds and was finally carried back to safety, still upside down, arms extended triumphantly. Once he was on the ground, the camera showed his unmasked face. He was not smiling—he looked as though he had seen a ghost. Then his name—our own beloved James Randi! What an ordeal! Impressive enough it would be in warm weather, but how could he withstand that cold? This was real bravery. It made me realize how little I know about the many respected persons whose names grace the inside covers of your publication.

How about a brief biographical sketch of one of these persons in each issue, so that we may know them better.

These are our heroes.

James H. Stein
Sarasota, Fla.

Problem with probability

In his article "Psychic Archaeology" (*SI*, Summer 1980), Kenneth L. Feder challenges David Jones's "experiments" in psychic archaeology on a number of points. In a bit of statistical analysis to support his position, Feder notes that the probability of flipping 10 straight heads with a true coin is 1/1024. He then claims that if this experiment is repeated 100 times that the probability increases to 100 times 1/1024. One supposes that if this was extended to 10,000 trials the probability of getting ten straight heads becomes 10,000 times 1/1024, making it several times more certain than either death or taxes.

May I suggest that the correct probability of an event occurring precisely once in n independent trials, if the probability of occurrence in one trial is p, is given by n times p times $(1 - p)$ raised to the $(n - 1)$th power. The probability of the event not occurring at all is $(1 - p)$ raised to the nth power.

John Swanson
Tustin, Calif.

Kenneth L. Feder states ". . . abandonment of statistical analysis by a person with an advanced degree in

anthropology is appalling." Unfortunately, Mr. Feder has abandoned elementary probability theory in his discussion of coin flipping. The probability that one obtains exactly 10 heads in 10 flips of an unbiased coin is 1/1024. In 100 sets of these 10 flips, the probability of obtaining at least one set of 10 heads is not 100/1024 as stated by the author. Such logic would lead one to conclude that in 2,000 sets of 10 flips the probability of obtaining one set of 10 heads is 2000/1024, which is clearly in error. The probability of obtaining at least one set of 10 heads in 100 sets of 10 flips each is $1 - (1023/1024)^{100}$. This number is approximately 100/1074. Mr. Feder's conclusions are still valid, of course, but the details of his thinking are flawed.

Donald B. Percival
Seattle, Wash.

Kenneth L. Feder replies:

I would like to thank Mr. Swanson and Mr. Percival for pointing out the error in my statistical example. I was inappropriately applying the addition rule of probabilities. In fact, repeating the coin flip experiment 100 times does not increase the probability of obtaining 10 successive heads to 100 times $1/2^{10}$. Without making any excuses for a silly error, it is nevertheless important to point out that the point I was trying to make is, of course, still valid. That is, in analyzing probabilistic phenomena, one must recognize that rare or unexpected events do occur. To point only to those rare events in an attempt to prove some paranormal process is a meaningless exercise. This is the approach employed by Jones in his attempt to prove the usefulness of "psychic archaeology." The questions "What constitutes a correct reading?" "What are the controls on the experiment?" "How will we judge when a 'psychic archaeologist' has indeed been more accurate than we would expect given the null hypothesis?" are never answered because, of the abandonment of statistics.

I apologize for the error in my example. It should, however, be abundantly clear that Jones has in no way proved that those who claim paranormal power can find archaeological sites, find artifacts at those sites, or reconstruct ancient cultures, regardless of my statistical error.

The PA and the AAAS

I am concerned over a statement in the Committee's response to the Parapsychological Association concerning the bogus letter that someone had sent to the PA (*SI*, Spring 1980). In regard to PA's expulsion from AAAS, the Committee's letter states: "We . . . would be opposed to such a move."

Certainly, the matter of acceptance or expulsion is solely the decision of the AAAS governing body, and it was disturbing to me when I learned of their admission of the PA to what is otherwise a scientific body of established value and integrity. Their publication *Science* ranks with *Nature* and similar outlets for resting their acceptance on scientifically sound, seminal research disclosures.

It is in this light, I maintain, that the bogus letter should have been simply acknowledged by an official statement that it was not from CSICOP. And is it significant that the signers of the reply letter are philosophers and writers but no member who represents what can be properly termed a scientific discipline?

A review of the AAAS annual meeting (*SI*, Summer 1980, p. 5) quotes James Randi (a signer of the reply letter) as follows: "He feared that to throw them out would be to make martyrs of them and produce accusations that the AAAS 'is just too fuddy-duddy' for their discoveries." Martyrs? Would astrologers, witches, Theosophists, and readers of the Tarot be martyrs if they applied and were rejected? Martyrs? Is one a martyr if he

is turned down after a job interview, doesn't make Phi Beta Kappa, doesn't get listed in *American Men of Science,* or is not chosen for the baseball team? Bosh! As for the term *fuddy-duddy:* unimaginative old-fashioned, pompous, concerned with trifles—it's a misnomer!—contemporary *real* science is none of these.

Again, Martin Gardner (a signer of the reply letter), in his review of C.E.M. Hansel's book (*SI,* Spring 1980, p. 62), finished with this lucid statement: "It is a book that should make clear to any open-minded reader the long and lonesome road parapsychology has yet to travel before it is accepted as a science. 'After 100 years of research,' Hansel concludes, 'not a single individual has been found who can demonstrate ESP to the satisfaction of independent investigators. For this reason alone it is unlikely that ESP exists.'"

In summary, where is the evidence? Where is *any* evidence? Until *that* vacuum is broken the efforts of scientists and their organizations should, in my opinion, be restricted to the fields of proven worth and utility.

Kerry E. Mills
Texas City, Texas

Skylab re-entry as pseudoscience

John D. Finarelli's letter "Skylab blessing" (*SI,* Winter 1979-80, p. 111) is amusing, but unfortunate in that it implies validity for what is surely one of the worst pieces of pseudoscience promulgated by the media in recent years: the story, made up out of whole cloth, of the supposed danger of Skylab's re-entry. The facts are these.

1. It wasn't even unusual. Over 600 space vehicles have survived re-entry, in greater or lesser part, during the space age (about one each ten days in recent years); none has ever hit anyone.

2. The chance any given person would get hit by a piece of Skylab last year was *one in 600 billion*—i.e. that person's chance of being *killed* by a poisonous snake was 600,000 times as great, and of being *killed* by lightning six *million* times as great, as of being *hit* by a piece of Skylab.

3. To be hit, preposterous though the chance was, need not imply to be hurt or killed; the only human in history we know for sure was hit by a natural meteorite was no more than bruised. Meteorites are usually cold, not the red-hot menaces of the news reports, by the time they land. And the atmosphere can slow meteorites heavier than even the largest Skylab fragments so drastically that they land quite gently; Peary found one *on* (not even slightly *in*) Greenland ice cap weighing 36½ tons, now on daily public display in New York's Museum of Natural History.

4. The chance that *no one on Earth* would be hit (let alone hurt or killed) was 99.3 percent. Three-quarters of Earth's surface is ocean; nine-tenths of the land is uninhabited; and a human anywhere is an awfully small target.

5. Skylab just happens to have been the most successful space mission ever flown by anyone for any reason—and the greatest tragedy of all is that that fact was never reported and the word "Skylab" has become a negative symbol in the public mind. Its soil and mineral discoveries alone could pay for the entire U.S. space program, manned and unmanned, Earth, lunar, and planetary, 1958 to date. It revolutionized our knowledge of the sun. Most important of all, it showed long-duration spaceflight, including weightlessness, is safe, thus literally opening the entire rest of the universe to human exploration.

Some may say the story was a harmless prank, a joke to liven up the "silly season." If so, it stopped being funny the day the first person died, literally of fear, from a heart attack induced through no fault of his own save trusting the media. It had long since stopped being funny when the president of the Philippines had to go on television to try to avert a national

panic. Oh, yes, all you connoisseurs of irony, Skylab's re-entry did indeed kill people—the same way voodoo does.

Our media—and I mean the mainstream media, even the most respected ones, not just supermarket tabloids—cried wolf, callously and with reckless disregard of the consequences. That is pseudoscience, by any definition of the term I know. A few of us realized it—those who could (and *did*) perform the 60 seconds or so of simple arithmetic needed to evaluate the true magnitude of the "danger" (a tiny percentage, to be sure). *What do we do now when the media report other alleged dangers that happen to be outside our field of expertise?* I'm an astronomer, not a nuclear engineer; can anyone out there tell me what I *should* think about Three Mile Island? All I know, after Skylab, is that I can't trust my friendly local paper to tell me the truth. And I find that least funny of all.

Jim Loudon
Staff Astronomer, Exhibit Museum
University of Michigan
Ann Arbor, Mich.

Need for exposé

I do congratulate you and persons associated with you on the fine honesty and balanced presentation in the SKEPTCAL INQUIRER, which I subscribe to and gladly have been recommending to others.

As a professor in a community college, I see on every hand the utter need for continuous exposure of "rackets and swindles, which would include cult practices already in the public record, so that students can be armed with the kind of critical sense which would better prepare them to evaluate cult recruitment tactics." I'm quoting an editorial in the August-September 1980 issue of *The Advisor*, published by the American Family Foundation.

At the same time, as a churchman (United Church of Christ) I do appreciate that you do not attack our ordinary churches and synagogues, which constructively serve local communities and hold families together. But frauds, occult hoaxes, psychic con-artists, and "religious" exploiters must continue to be exposed.

I, and others, am working hard to warn students about psychic deceptions, to inform them about destructive cults, and to help get victims of both these traps away from those who are damaging them.

Wallace Winchell
Manchester, Conn.

The Jimmy Carter UFO

I am writing to protest a reference by astronomer John Kenny (in his review, *SI*, Summer 1980, pp. 53-54) in which Jimmy Carter's UFO sighting and the New Zealand UFO film of December 31, 1978, are referred to as "well-explained sightings." This is a tactic that smacks of propaganda techniques used in brain-washing, and it is also a type of technique that cheap sensationalist UFO magazines unfortunately use. Such methods do not belong in a scientific journal. By saying that certain sightings are "well-explained," the unknowing reader assumes that this is fact.

The truth is that both sightings are far from being well explained at all, although attempts at explanation have been made. The Carter sighting was alleged by Bob Sheaffer to have been caused by the planet Venus ("The Queen of UFOs") because it was in the sky at the time *(Humanist*, July 1977). Sheaffer ignores the fact that Carter had seven years of sea duty behind him, in which as a line officer he often had to navigate by using Venus and other planets and stars. Carter also took celestial navigation and astronomy at Annapolis, and graduated in the top 60 of a class of more than 800 cadets. It is hardly likely that Carter would misread

an old familiar planet for a UFO. Sheaffer also ignores conveniently that Carter reported that the UFO was as "bright as the moon," which is considerably brighter than Venus, and that the object "approached and receded several times." Amazingly, Sheaffer refutes this statement by saying that Venus doesn't do that sort of thing! Obviously, if the object *did* that sort of thing, then it wasn't Venus.

We can never know what really happened back in 1969 in Georgia, but until someone can interview Mr. Carter about the event, I would suggest that it is better described as unexplained.

Jon Beckjord
Seattle, Wash.

Robert Sheaffer replies:

If witnesses were infallible recording instruments, Mr. Beckjord's charges would be well founded. But he seems unaware of the volume of scientific analyses documenting unreliability of unsubstantiated human eyewitness testimony. (See Robert Buckhout, "Eyewitness Testimony," Scientific American, *December 1974; Elizabeth F. Loftus, "The Malleability of Human Memory,"* American Scientist, *May/June 1979.) The classic case of misperception in the recent UFO literature is in Allan Hendry's excellent* The UFO Handbook *(Doubleday, 1979), which describes an alleged "close encounter" UFO case in Aurora, Illinois, that had many mystifying but nonexistent properties ascribed to it—it turned out to be an advertising aircraft. No one who carefully studies Hendry's book or Klass's* UFOs Explained *can afterward take unsubstantiated testimony at face value, as Beckjord does. I note that Beckjord fails to mention that many UFO proponents agree with me that the Carter UFO sighting is a very poor one and that another Georgian standing with Carter was, as my* Humanist *piece makes clear, quite unimpressed with the light they saw in the sky.*

Cosmic Watergate

Stanton Friedman [*SI*, Fall 1980] sharply criticizes my article in your Spring 1980 issue because it quoted from an article in the *Oakland Tribune* that was based on an interview with Friedman. Friedman charges that "the original *Oakland Tribune* article . . . was almost completely inaccurate."

On July 27, in response to Friedman's charge, I wrote to him to ask whether he had ever written to the *Oakland Tribune* to protest the alleged inaccuracies. Friedman never replied, but on September 5 we met in Washington at a press conference sponsored by the Fund for UFO Research, where Friedman repeated his charges of a "Cosmic Watergate" coverup of UFOs by the U.S. government (the same phrase used in the *Oakland Tribune* article).

Friedman told me that he had not bothered to write to the *Oakland Tribune* to protest the alleged gross errors in its article. The reason he had not done so, Friedman explained, was that he had written a letter to the editor of the *New York Times* that had not been published, "so why should I write to the *Oakland Tribune!*"

Philip J. Klass
Washington, D.C.

Creationism and the courts

I read with empathetic pain Laurie R. Godfrey's article in the Fall 1979 issue entitled "Science and Evolution in the Public Eye." The concept of biological evolution is certainly one of the major accomplishments of the human intellect, and any schoolchild denied a fairly thorough and accurate introduction to the concept and its current status has not been properly educated. On the other hand, the primitive creation myths espoused by various religions have no place whatever in the science courses in our public schools.

The most direct route to getting the

religious creation myths out of public school science textbooks and teaching is to take the matter to the U.S. Supreme Court, where relief has previously been obtained against several intrusions of religions into our public schools

It seems to me that when a Judeo-Christian creation myth is forced upon the teachers of biology and into public school textbooks a support for religion is thereby achieved. This intrusion should be fought in the courts.

Clyde O. Davis
Wenonah, N.J.

Unproductive sarcasm

I have read my first copy of the SKEPTICAL INQUIRER and, for the most part, I enjoyed doing so. I certainly have been alarmed to see many friends and some relatives uncritically accept what I consider to be remarkably outlandish claims of the paranormal.

However, I do have a criticism of the style of your publication, which I offer for your consideration and evaluation. Some of your articles have an unbecoming sarcastic and belittling style that partially obstructs their ability to transmit their message to those who need it most. I refer specifically to James Randi's article on Edgar Cayce in the Fall 1979 issue. I enjoyed his sarcastic humor, but I have found that the article is seriously offensive to my friends who believe in Edgar Cayce, not so much for what is said but for *how* it is said. I think that if the facts are on "our" side with regard to the bogusness of most (if not all) claims of the paranormal, then we need not take sarcastic shots at our adversaries. Let your articles simply state the facts as indicated by the principles of good scientific method, and let the evidence therefrom speak for itself.

Jeff Jones
Tahoma, Calif.

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The Committee for the Scientific Investigation of Claims of the Paranormal

The Committee for the Scientific Investigation of Claims of the Paranormal attempts to encourage the critical investigation of paranormal and fringe-science claims from a responsible, scientific point of view and to disseminate factual information about the results of such inquiries to the scientific community and the public. To carry out these objectives the Committee:

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- Prepares bibliographies of published materials that carefully examine such claims.
- Encourages and commissions research by objective and impartial inquirers in areas where it is needed.
- Convenes conferences and meetings.
- Publishes articles, monographs, and books that examine claims of the paranormal.
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